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THE JOURNAL

OF THE

American Medical Association

Subscription, $8.00 | PUBLISHED WEEKLY | Single Copies, 25 Cents

VOLUME 112, No. 16 | APRIL 22, 1939

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535 North Dearborn Street, Chicago, Ill.

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THE JOURNAL of the American Medical Association is published weekly by the American Medical Association, 535 North Dearborn Street, Chicago, Ill. Subscription price, $8.00 a year. 25c a copy. Canadian $9.50. Foreign $12.00. Entered as second class matter June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879.

The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 112, No. 16 — COPYRIGHT, 1939, BY AMERICAN MEDICAL ASSOCIATION CHICAGO, ILLINOIS — APRIL 22, 1939

COMPLICATIONS DUE TO ARSENICAL THERAPY IN SYPHILITIC PREGNANT WOMEN

REPORT OF SEVEN MATERNAL DEATHS

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PHILADELPHIA

Recent writings convey the impression that pregnant syphilitic women tolerate arsenical therapy well.[1] In fact, the fear of serious reaction to the intravenous treatment of these patients with the arsphenamines has become so remote that some authorities recommend this prophylactic procedure for the unborn child, even "on suspicion" that the prospective mother may be diseased.[2] McCord,[3] who has apparently never seen a serious treatment reaction or death in the medical supervision of more than 2,000 syphilitic pregnant women, remarks that "such therapy seems to be safe for the mother." The Cooperative Clinical Group, with Cole [4] as spokesman, feels that, regardless of antecedent therapy, in order to insure the birth of a healthy child it is desirable to treat intensively throughout each pregnancy every woman who has ever had syphilis, whether the serologic tests of the blood for syphilis are positive or negative or the infection is early or late. Hoffmann,[5] voicing the opinion of one of the most progressive schools of European medical thought, in his recent lecture in this country goes one step further, recommending that "one or two combined courses should be given as a protection to the offspring" of an apparently well mother, notwithstanding "the absence of diagnostic signs and the presence of a negative serum reaction," provided her husband is known to be syphilitic.

In prescribing antisyphilitic therapy for a pregnant syphilitic woman, consideration of the well-being of the prospective mother should take precedence over the health of the unborn child, as in all other obstetric procedures. The infected woman, under medical observation and treatment during nine months at the most, and on an average during only three or four months of her pregnancy, cannot hope to have her disease cured or in most cases even materially benefited. In all except an occasional case therefore the physician is concerned with a purely prophylactic procedure, employed to prevent the offspring from becoming diseased. Without in any way denying that the treatment of the pregnant syphilitic woman to prevent her infant from becoming infected in utero is one of the most effective forms of preventive medicine known today, it should be used with caution if the hazard to the mother is appreciable.

Many of the current opinions concerning the fact that "the pregnant syphilitic woman is a good risk for arsenical therapy" are gleaned from the statistics obtained by an analysis of the records of some 4,600 injections of arsphenamine administered to 603 expectant mothers at the five university clinics (Johns Hopkins, University of Pennsylvania, University of Michigan, the Mayo Clinic and Western Reserve University) cooperating with the United States Public Health Service.[6] They found no significant difference in minor arsenical reactions in the pregnant and nonpregnant groups, but the pregnant women experienced fewer severe arsenical reactions than the nonpregnant (3.08 per thousand injections for the latter, as compared with 0.87 for the former).

This point of view, however, is not without its opponents. To mention only a few of the more recent, Stokes [7] says: "There is no doubt in my mind that the pregnant woman is not eligible, in general, for strenuous treatment regimens. The pregnant woman should not be overloaded and any signs of reactivity must be taken more seriously than in the normal case." Certain circumstances "may make it preferable to take chances for the child with heavy metal or even no treatment rather than risk the mother's life with a standardized system" (see also Wile and Shaw [8]). As a result of their studies, Plass and Woods [9] were forced to conclude "that pregnant syphilitic women are more susceptible to the deleterious, as well as to the beneficial, effects of antisyphilitic therapy by modern arsenicals than other individuals." Kühnel [10] has gone even further in suggesting that "it may be necessary for us to modify our therapeutic view of the prophylactic and syphilitic treatment in pregnancy" (see also Woods [11]).

While the fact has always impressed me that special care is necessary in handling the syphilitic pregnant

1. McCord, J. R.: Syphilis and Pregnancy, Am. J. Syph., Gonor. & Ven. Dis. **12**: 181 (April) 1928. Wile and Shaw.[8] Hoffmann.[30]
2. Moore, J. E.: The Modern Treatment of Syphilis, Baltimore, Charles C. Thomas, Publisher, 1933, p. 251.
3. McCord, J. R.: Syphilis and Pregnancy: A Clinical Study of 2,150 Cases, J. A. M. A. **105**: 89 (July 13) 1935.
4. Cole, H. N., and others: Cooperative Clinical Studies in the Treatment of Syphilis: Syphilis in Pregnancy, Ven. Dis. Inform. **17**: 39 (Feb.) 1936. Cole, H. N.: Congenital and Prenatal Syphilis, J. A. M. A. **109**: 580 (Aug. 21) 1937.
5. Hoffmann, Erich: Congenital Syphilis, Am. J. Syph., Gonor. & Ven. Dis. **22**: 198 (March) 1938.
6. Cole, H. N., and others: Syphilis in Pregnancy, Ven. Dis. Inform. **15**: 83 (March) 1934.
7. Stokes, J. H.: Modern Clinical Syphilology, Philadelphia, W. B. Saunders Company, 1934, p. 1280.
8. Wile, U. J., and Shaw, J. W.: The Prenatal Treatment of Syphilis with Especial Reference to Early Syphilis in the Mother, J. A. M. A. **95**: 1791 (Dec. 13) 1930.
9. Plass, E. D., and Woods, E. B.: Hemorrhagic Encephalitis (Neoarsphenamine) in Obstetric Patients, Am. J. Obst. & Gynec. **29**: 509 (April) 1935.
10. Kühnel, Poul: Death from Salvarsan Treatment in Prgenancy, Acta obst. et gynec. Scandinav. **13**: 29, 1933.
11. Woods, E. B.: Complications of the Treatment of Syphilis in Pregnancy: Report of Three Cases of Arsenical Encephalitis Complicating Such Treatment, J. M. A. Georgia **25**: 23 (Jan.) 1936.

woman, the realization of the importance of this question has recently been reemphasized by Dr. Philip F. Williams, who called my attention to the seven maternal deaths directly attributable to arsenical therapy which have been reported in one locality since 1931 to the Committee on Maternal Welfare of the Philadelphia County Medical Society. In addition, a careful review of the statistics obtained from the administration of 6,345 injections of neoarsphenamine to 733 pregnant syphilitic women during the last five years at the Philadelphia General Hospital revealed a much higher incidence of treatment reactions than is generally attributed to this type of therapy among such patients.

Several additional circumstances made it seem worth while to discuss this problem. In the first place there are in the literature relatively few series of cases large enough to warrant the drawing of accurate conclusions concerning the incidence of treatment reactions among pregnant syphilitic women. Then at least one group of observers tended to collect data only from patients who had been under observation for at least six months.[12] Many pregnant syphilitic women remain under observation for a shorter period than this, particularly if they are intolerant of arsenical therapy. Furthermore, the incidence of reactions probably varies greatly, depending on the economic status of the patients, their state

TABLE 1.—*Treatment Reactions Complicating Arsenical Therapy of 733 Pregnant Syphilitic Women at Philadelphia General Hospital, as Compared with the Statistics of the Cooperative Clinical Group[6] on Syphilitic Mothers "Not During Pregnancy"*

	Reactions	Philadelphia General Hospital: Number of Reactions (6,345 Injections)	Philadelphia General Hospital: Rate per Thousand Injections	Cooperative Clinical Group[6]: Rate per Thousand Injections (6,431 Injections)
Mild	Gastrointestinal disorders	144	22.75	6.22
	Nitritoid crisis	24	3.79	3.73
	Pruritus	8	1.26	1.71
	Cutaneous eruptions	27	4.27	4.04
	Transient irritability of the kidneys	14	2.61	0.16
Severe	Purpuric phenomena (with thrombopenia)	7	1.11	0.00
	Arsenical stomatitis	1	0.16	0.00
	Crustaceous dermatitis	2	0.32	1.40
	Icterus	8	1.26	0.62
	Death (colloidoclastic shock)	1	0.16	0.00

of nutrition and their environment. Thus a patient at Philadelphia General Hospital would be expected to react differently from one at a university clinic or a private patient, and conclusions drawn for one group could not always be transferred directly to the next. Moreover, I am forced to the conclusion, from various references in the literature, that severe treatment reactions among pregnant women are much more frequent than is generally supposed.[10] Thus, McKelvey and Turner [13] and Moore [14] both mentioned the four deaths from acute yellow atrophy of the liver which followed arsenical therapy of syphilitic pregnant women at the Johns Hopkins Hospital. Clason [15] referred to eclampsia in one of his cases as being precipitated by arsenical therapy. Klaften [16] and Reif [17] both described patients with symptoms of hemorrhagic encephalitis who recovered. Spillmann, Weille and Weissmann [18] referred to a young pregnant woman with early syphilis in whom hemiplegia developed during arsenical therapy. Audebert and Fabre [19] reopened the question of erythrodermia and dermatitis complicating antisyphilitic therapy of pregnant women. Finally it is entirely possible that delayed arsenical reactions resulting from treatment during pregnancy, for example damage to the liver or bone marrow, the symptoms of which often take several weeks to appear, have not uniformly been recorded as reactions resulting from treatment during pregnancy when the initial symptoms have appeared after delivery. If this is true, it would lead to a false impression as to the incidence of more severe types of reaction among treated syphilitic pregnant women.

TREATMENT REACTION: IN THE ANTEPARTUM SYPHILIS CLINIC OF PHILADELPHIA GENERAL HOSPITAL

Table 1 summarizes five years' experience with treatment reactions in the antepartum syphilis clinic at the Philadelphia General Hospital. The group studied was roughly one third white and two thirds Negro. Unfortunately it was not possible for me to obtain data as to the total incidence of treatment reactions in the type of nonpregnant patients attending the general syphilis clinic of his institution, and it may be that this figure also is higher than normal. In order to make my own statistics somewhat more understandable, however, I have incorporated in the table the reaction rate per thousand injections from the figures of the Cooperative Clinical Group for syphilitic women treated between their pregnancies; it happens that an almost identical number of injections were given to each of these groups. This comparison brings out strikingly the facts which have been noted previously by various investigators,[20] namely the pregnant woman's increased susceptibility to gastrointestinal reactions, to irritation of the kidneys and to hepatic insufficiency. In pregnant women nausea, vomiting and diarrhea as a result of arsenical therapy are roughly three and one half times more frequent, jaundice is twice as frequent and evidence of kidney strain is about sixteen times more frequent than in nonpregnant women. It is interesting to note that among the women treated at the Philadelphia General Hospital the incidence of gastrointestinal disturbances was twice as great, of pruritus and cutaneous eruptions three times and twice as great, respectively, and of icterus six times as great as in the series of pregnant women whose cases were reported by Cole and his co-authors.[6]

In this series there was no evidence that pregnant syphilitic women tolerate arsenical therapy well. Only in the case of generalized exfoliative dermatitis was the incidence appreciably lower than in the nonpregnant group. Here again the duration of therapy was probably an important factor, since such a reaction usually occurs after a longer course of arsphenamine than these

12. Cole, H. N., and others: Cooperative Clinical Studies in the Treatment of Syphilis: Arsenical Reactions, Ven. Dis. Inform. **14:** 175 (Aug.) 1933; Syphilis in Pregnancy.[6]
13. McKelvey, J. L., and Turner, T. B.: Syphilis and Pregnancy: An Analysis of the Outcome of Pregnancy in Relation to Treatment in 943 Cases, J. A. M. A. **102:** 503 (Feb. 17) 1934.
14. Moore: The Modern Treatment of Syphilis, p. 98.
15. Clason, S.: Eklampsie oder Salvarsanvergiftung? Drei Todesfälle mit diskutabler Genese, Acta obst. et gynec. Scandinav. **12:** 40, 1932.
16. Klaften, E.: Die Prinzipien der antisyphilitischen Behandlung der Schwangeren, Arch. f. Gynäk. **135:** 620 (Feb.) 1929.
17. Reif, F.: Ueber gehäuftes Auftreten von Enzephalitis nach Neosalvarsan, München. med. Wchnschr. **68:** 14 (Jan. 7) 1921.
18. Spillmann, L.; Weille, R., and Weissmann: Hémiplégie post-arsénobenzolique, Bull. Soc. franç. de dermat. et syph. **43:** 1380 (July) 1936.
19. Audebert, J. L., and Fabre, Jacques: Accouchement prématuré et érythrodermie dus au néo-salvarsan, Bull. Soc. d'obst. et de gynéc. **17:** 779 (Oct.) 1928.
20. Lewin, E. M.: Neues zur Lehre über die Toxische Wirkung der Arsenobenzolpräparate auf die Leber, Arch. f. Dermat. u. Syph. **166:** 711 (Oct.) 1932.

patients received (average 8.4 injections). In the two cases in this series in which this manifestation did occur, it developed at about the time of delivery and extended some weeks into the puerperium.

The number of pregnant syphilitic women who become nauseated and vomit after neoarsphenamine treatment is noteworthy. This reaction is rarely an indication for suspension of arsenical therapy or even for reducing the dose. In my 733 cases the severity of this reaction made it necessary to stop intravenous injections in twelve cases. Nine additional patients were carried along with little discomfort by reducing the size of the dose and administering 1/100 grain (0.6 mg.) of atropine sulfate. Irritability of the kidneys likewise is not an indication for cessation of treatment unless the patient shows evidence of toxemia of pregnancy, such as increasing hypertension, headache, disturbance of vision, marked albuminuria or edema of the ankles. In the presence of definite or incipient toxemia it has been my experience that no type of antisyphilitic therapy is well tolerated, and, since the risk in administration of these drugs is great to a patient whose elimination is poor, it is best to discontinue antisyphilitic treatment entirely. The jaundice which I have seen has occurred close to term and, on the cessation of arsenical therapy, has cleared up post partum without evidence of permanent hepatic damage. The death recorded in table 1 is that in case 4, described subsequently.

MATERNAL MORTALITY FROM ARSENICAL THERAPY DURING PREGNANCY

In an effort to demonstrate that the pregnant syphilitic woman is by no means immune to the serious treatment reactions attending antisyphilitic therapy and to suggest, moreover, that she may be, as some authors feel, more susceptible than the nonpregnant woman, thirty-five reported cases have been collected and summarized, and the seven cases discussed before the Maternal Welfare Committee of the Philadelphia County Medical Society have been briefly analyzed. The cases gathered from the literature include the twenty-three described in detail by Kühnel,[10] the case of eclampsia reported by Clason,[15] the cases of exfoliative dermatitis of Lorenzen [21] and Kirstein [22] and the cases reported by Scheel,[23] Neustadt,[24] Cole and his associates,[25] Plass and Woods,[9] Cormia,[26] Gierlich and Künkele [27] and Lanzenberg and Laugier.[28]

These forty-two cases represent most of the known types of serious arsenical complications (table 2). In almost two thirds the condition falls into the category of acute encephalopathy, which has come to be termed in the literature acute hemorrhagic encephalitis because of the intense cerebral congestion revealed by autopsy (wet brain with multiple punctate hemorrhages [29]). The fact that pregnant syphilitic women are particularly susceptible to this type of treatment reaction was early recognized by Meirowsky,[30] Gammeltoft [31] and Klaften,[16] and the question has recently been reviewed by Cormia [26] and by Plass and Woods.[9] Kühnel [10] has given a graphic description of the condition, which, coming on in the latter part of the pregnancy, most often after from one to three arsenical injections to a woman with early syphilis, with the symptom sequence of headache, vertigo, malaise, nausea, vomiting, hyperpyrexia, clonic convulsions, unconsciousness, cyanosis and death within twenty-four to seventy-two hours, forms a distinctive clinical entity.[31a]

TABLE 2.—*Cause of Thirty-Five Fatal Arsenical Reactions Collected from the Literature, with Seven Additional Cases from the Philadelphia County Medical Society*

	From Literature	My Cases	Total	Percentage
Acute encephalopathy (hemorrhagic encephalitis)	24	3	27	64.3
Acute circulatory collapse (colloidoclastic shock)	2	2	4	9.5
Parenchymatous degeneration of the liver (and kidneys)	2	1	3	7.1
Arsphenamine dermatitis	2	..	2	4.8
Aplastic anemia	0	1	1	2.4
Eclampsia (precipitated by antisyphilitic therapy)	1	..	1	2.4
Cause unknown	4	..	4	9.5
	35	7	42	100.0

Acute circulatory collapse most often follows the second or third arsenical injection and presents the picture clinically of colloidoclastic shock described by Orr [32] and Weinberg [33] and pathologically of dilatation and intense congestion of all peripheral vessels (case 4). In both cases,[34] of arsphenamine dermatitis the condition was complicated by pyodermia and puerperal sepsis developing post partum. Eclampsia accompanying arsenical therapy or precipitated by it may be more frequent than the single case recorded by Clason [15] would indicate. In connection with the case of aplastic anemia (recorded subsequently) it should be noted that definite symptoms of the condition did not develop for from four to eight weeks after delivery and that in a statistical compilation it would be easy to overlook such a condition as resulting from arsenical therapy during pregnancy.

REPORT OF CASES

CASE 1.—*Death from aplastic anemia.*[34a] *History.*—An apparently healthy white woman aged 18, reported Oct. 2, 1936, for antepartum supervision during the fourth month of her

21. Lorenzen, H.: Ueber einen Fall von Salvarsanvergiftung in der Schwangerschaft mit tödlichen Ausgang im Wochenbett, Zentralbl. f. Gynäk. **45**: 1407 (Oct. 1) 1921.
22. Kirstein, F.: Salvarsanexanthem in der Graviditat und Exitus im Wochenbett, Zentralbl. f. Gynäk. **46**: 1634 (Oct. 14) 1922.
23. Scheel, V.: Tilfaelde af akut Leveratrofi; Syfilis Graviditet; Salvarsanintoxikation, Ugesk. f. læger. **81**: 1817 (Nov. 20) 1919.
24. Neustadt, A.: Ein Todesfall nach einzeitig kombinierter intravenöser Neosalvarsan-Novasurolbehandlung der Syphilis nach Bruck, Deutsche med. Wchnschr. **47**: 808 (July 14) 1921.
25. Cole, H. N., and others: Toxic Effects of the Arsphenamines, J. A. M. A. **97**: 897 (Sept. 26) 1931.
26. Cormia, F. E.: Hemorrhagic Encephalitis from Neoarsphenamine in Pregnancy, Canad. M. A. J. **35**: 610 (Dec.) 1936.
27. Gierlich, J., and Künkele, F.: Pathologisch-anatomische und chemische Untersuchungen bei einem Fall von Salvarsantod in der Schwangerschaft, Deutsche Ztschr. f. d. ges. gerichtl. Med. **27**: 116 (Sept.) 1936.
28. Lanzenberg, P., and Laugier, P.: Mort rapide survenue chez une femme enceinte au cours d'un traitement arsénobismuthique avec vomissements, vertiges, légères contractures musculaires, état comateux, foyers hemorrhagiques au niveau du bulbe, Bull. Soc. franç. de dermat. et syph. **43**: 477 (March) 1936.
29. Cook, S. S.: Postmortem Findings in Fatalities Due to the Use of the Arsphenamine Group: A Review of 44 Autopsies, Pub. Health Rep. **51**: 927 (July 10) 1936.
30. Meirowsky, E.: Bericht der Salvarsankommission des Allgemeinen Aerztlichen Vereins in Köln, München. med. Wchnschr. **67**: 477 (April 23) 1920.
31. Gammeltoft, S. A.: Ueber einen Fall von Encephalitis hämorrhagica nach Salvarsanbehandlung während der Schwangerschaft, Acta obst. et gynec. Scandinav. **9**: 167, 1930.
31a. Four additional deaths from hemorrhagic encephalitis among pregnant syphilitic women in the recent literature of this country tend to stress the increasing importance of this complication. They are reported by:
Sawyer, K. C., and Dwyer, P. K.: Hemorrhagic Encephalitis Following Injection of Neoarsphenamine, Colorado M. J. **33**: 250 (April) 1936.
Kuehn, Conrad; Keating, R. A., and von Haam, E.: Arsenical Encephalitis During Pregnancy, Am. J. Obst. & Gynec. **36**: 122 (July) 1938.
Paley, S. S., and Pleshette, Norman: Hemorrhagic Encephalitis in Pregnancy Following Antisyphilitic Therapy with Neoarsphenamine, Am. J. Syph., Gonor. & Ven. Dis. **23**: 691 (Jan.) 1939.
32. Orr, Harold: Medical Shock Following Use of Neoarsphenamine, Brit. J. Dermat. **45**: 58 (Feb.) 1933.
33. Weinberg, Tobias: Medical Shock Following Intravenous Therapy with Neoarsphenamine, Am. J. Syph., Gonor. & Ven. Dis. **21**: 376 (July) 1937.
34. Lorenzen.[21] Kirstein.[22]
34a. Mortimer Goldberg (Am. J. Syph., Gonor. & Ven. Dis. **23**: 79 [Jan.] 1939 has recently reported a case of bone marrow injury from neoarsphenamine therapy in a syphilitic pregnant woman with recovery.

second pregnancy. The previous pregnancy, which terminated Nov. 5, 1935, had resulted in a living infant with congenital syphilis. The mother's infection was latent; serologic study of the blood at the time of the first visit showed the Kolmer reaction 44 and the Kahn 444. The stage of the disease was unknown, but it was probably early. Her antepartum course was uneventful, except that she showed a trace of albumin in the urine on five different occasions in late pregnancy. The blood pressure varied between 94 and 120 mm. of mercury systolic and 48 and 84 diastolic. She was delivered of a normal infant after seven hours of labor March 9, 1937. Her hemoglobin concentration was 81 per cent immediately post partum.

Antisyphilitic Therapy.—During pregnancy, from Oct. 2 to Nov. 6, 1936, she received six 2 cc. injections of bismuth subsalicylate (each cubic centimeter equals 60 mg. of metallic bismuth). From Nov. 13 to March 6, 1937, she received concurrent treatment with triarsen [35] and a bismuth preparation (total, twelve injections of triarsen [5.75 Gm.] and sixteen injections of bismuth salicylate [31 cc.] without reaction. She received no treatment for syphilis post partum.

Course.—She was readmitted to the hospital May 17, 1937, because of vaginal bleeding, which had continued since the birth of the child, gradually becoming worse, with recent abdominal pain and passage of clots, bleeding gums for one month, epistaxis, and purpuric spots on the arms and lower extremities of six weeks' duration. At the time of admission gingival ulcerations were noted. There was abundant albuminuria from May 19 to death. The results of studies of the blood are shown in table 3. Transfusions were given May 19, 22 and 26, but the patient died with marked hyperpyrexia (temperature 105 F.) May 27.

TABLE 3.—*Results of Studies of the Blood in Case 1*

Date	Erythrocytes	Hemoglobin, %	Leukocytes	Neutrophils	Lymphocytes	Monocytes	Transitional Forms	Eosinophils	Basophils	Platelets
5/19/37	780,000	10	7,000	27	70	2	0	1	0	.....
5/20/37	1,840,000	35	6,000	17	80	2	1	0	0	82,600
5/21/37	.....	45	.....	40	60	..	..	..	..	.....
5/25/37	2,960,000	58	4,000	5	95	..	..	..	..	92,600
5/26/37	2,000,000	40	2,600	..	..	..	..	..	..	.. ...
5/27/37	2,360,000	50	1,800	4	96	..	..	..	..	... ..

Autopsy.—Aplastic anemia following arsenical therapy, with generalized purpuric phenomena, was reported. The skin, mucosal surfaces and serosa showed evidence of ecchymoses throughout. There were confluent lobar hemorrhages in the lungs, acute passive congestion in the liver and follicular hyperplasia and passive congestion in the spleen. The kidneys showed extreme cloudy swelling and acute gangrenous pyelitis. Histologic examination of bone marrow gave results typical of aplastic anemia.

CASE 2.—*Acute yellow atrophy of the liver. History.*—A well developed and well nourished Negro woman aged 38 reported Jan. 7, 1936, for antepartum supervision in the twenty-sixth week of her second pregnancy. She had had a negative Wassermann reaction in another institution in January 1935, but strongly positive Kolmer and Kahn reactions were present on her first antepartum visit; the results were confirmed January 14. She gave no history of previous treatment and no history of onset of infection.

Antisyphilitic Therapy.—She received four injections of bismarsen (0.2 Gm. each) intramuscularly between January 21 and February 25 without reaction.

Course.—March 3 she was admitted to the hospital because of increasing jaundice, icteric skin and scleras, deep colored urine and clay colored stools. After admission severe gastric hemorrhage developed; the patient could retain no food taken by mouth and finally became comatose and died March 10.

Autopsy.—Syphilitic aortitis, marked jaundice and acute yellow atrophy of the liver were evident. In this case it is impossible to state whether the arsenical therapy was the sole cause or merely the precipitating cause of death, but it was felt that it played at least some part in the unfortunate outcome.

CASE 3.—*Acute circulatory collapse. History.*—A Negro woman aged 32 reported in January 1933 for antepartum supervision in the twenty-sixth week of her third pregnancy. Serologic study of the blood gave strongly positive results at the time of her first visit (Kolmer 44, Kahn 444). The duration of her disease was unknown, but she was found to have a positive serologic reaction of the blood for syphilis in another institution in 1927 and had received arsenical therapy for thirteen weeks at that time, with none since. Complete cardiovascular study March 15 showed possible syphilitic aortitis and signs of "potential" myocardial involvement.

Antisyphilitic Therapy.—April 1 she received 0.025 Gm. of bismarsen intramuscularly, April 8 0.3 Gm. of neoarsphenamine and April 15 0.45 Gm. of neoarsphenamine, without reaction. With the third injection (0.45 Gm.) of neoarsphenamine, given April 22, she became dyspneic and cyanotic while in the treatment room, with a fall of blood pressure and rapid almost imperceptible pulse. She became comatose within a few minutes and, although admitted to the hospital immediately and given emergency stimulative treatment, died within an hour.

Autopsy.—Syphilitic aortitis and coronary and myocardial involvement were present, with acute dilatation of the heart. There was generalized acute passive congestion. Death may have been due to coronary insufficiency, the result of the rapid healing fibrosis of therapeutic paradox, but the sudden onset of symptoms during injection also brings up the question of acquired arsenical intolerance. The brain was not examined. Nothing observed ante partum among the terminal symptoms or at autopsy suggested toxemia of pregnancy.

CASE 4.—*Acute circulatory collapse. History.*—An apparently healthy Negro woman aged 22 reported to the antepartum clinic during the fourth month of her fifth pregnancy. Kahn and Kolmer-Wassermann tests performed November 3 and on two subsequent visits gave negative results. She was known to have syphilis, however, having first been discovered to have a positive serologic reaction of the blood in 1931. She had had no arsenical treatment during her first pregnancy, two months of arsenical therapy during her second, nine months of arsenical and heavy metal therapy during her third, and two months of arsenical therapy during her fourth. She had had no treatment for syphilis for one year prior to her present conception and would have been considered clinically "cured." In view of the fact that she had tolerated previous treatment well, and since she appeared in good health and normal on physical examination, it was decided to treat her for the sake of her child. Antepartum supervision between Nov. 3, 1937, and Jan. 12, 1938, revealed normal blood pressure and urine and no evidence of toxemia of pregnancy.

Antisyphilitic Treatment.—Neoarsphenamine 0.3 Gm. was given intravenously Jan. 12, 1938, with no reaction; 0.45 Gm. was given January 19.

Course.—Ten minutes after her second injection she complained of acute abdominal pain and collapsed on the floor. Within five minutes she lost consciousness; the skin became cyanotic, cold and clammy and the pulse rapid and thready. The blood pressure, at first maintained, became rapidly lower. She exhibited muscular twitching and choreiform movements and in spite of stimulative treatment (epinephrine, atropine, caffeine) died within one hour.

Autopsy.—There was no evidence of syphilis in any of the organs. The picture was that of acute circulatory collapse, with generalized capillary dilatation. The lungs, spleen, liver and kidneys showed intense acute passive congestion. The heart, coronary vessels and aorta were normal. The bones of the skull were hemorrhagic, the dural sinuses were dilated and there was intense congestion with subarachnoid hemorrhage. The brain was intensely edematous, with hemorrhages into the ependymal lining of the ventricles. It was felt that the intracranial as well as the general systemic picture was merely attendant on the acute circulatory collapse.

35. Stokes, J. H., and Beerman, Herman: New Arsphenamine Synthetics in the Treatment of Syphilis: A Consideration of Test Procedure and of a New Drug (Triarsen), Arch. Dermat. & Syph. **35**: 78 (Jan.) 1937.

CASE 5.—*Acute encephalopathy. History.*—A Negro woman aged 30, married, in good general health, reported for antepartum supervision in the sixth month of her third pregnancy. On the first visit she was discovered to have weakly positive Kolmer and Kahn reactions. She gave no history of antecedent antisyphilitic therapy, and the duration of her infection was unknown. Her blood pressure and urine were always normal.

Antisyphilitic Treatment.—Neoarsphenamine 0.3 Gm. October 8 and 0.6 Gm. October 15 was given without evidence of intolerance.

Course.—Two days after the last injection she was admitted to the hospital because of dizziness and pain in the lower part of the abdomen. October 18 she had a bilateral convulsion lasting ten minutes and three hours later two generalized convulsions of short duration, following close one on the other. She was unconscious thereafter until death, some five hours later. There were no clinical or laboratory signs of eclampsia; a normal living child was delivered immediately after the death of the mother.

Autopsy.—Nothing significant was observed except evidence of acute encephalitis, with exudation and capillary hemorrhage, and parenchymatous cerebral syphilis. It is impossible to state in this case whether death resulted from therapeutic shock (Herxheimer reaction) in an area already diseased from syphilis or from the hemorrhagic encephalitic syndrome, so frequently described as complicating arsenical therapy among pregnant women. Death apparently did not result, however, from a massive intracranial hemorrhage or from any gross single lesion.

CASE 6.—*Acute encephalopathy. History.*—A healthy young white woman aged 24 reported for antepartum supervision Oct. 21, 1932, during the sixth month of her first pregnancy. Syphilis was diagnosed by means of a strongly positive Wassermann test, confirmed. The duration of the disease was unknown.

Antisyphilitic Therapy.—Neoarsphenamine 0.5 Gm. October 31 and 0.5 Gm. November 14 was given without reaction.

Course.—Shortly after the second injection the patient became nauseated and vomited, the reaction continuing until she was admitted to the hospital November 16. At this time she complained of severe headache and was restless, stuporous and markedly spastic. Before death twenty-four hours later she became unconscious and cyanotic and had focal and generalized convulsions; her temperature rose from 102 F. on admission to 106 at the time of death. Complete laboratory studies gave no evidence of eclampsia. There was no albumin in the urine. The blood showed sugar 120 mg., urea 13 mg., urea nitrogen 9.4 mg., creatinine 2.7 mg., calcium 8 mg. and phosphorus 3.5 mg. per hundred cubic centimeters. The blood pressure varied between 112/60 and 130/60. In the cerebrospinal fluid there were 1 mg. of globulin, no sugar, 1 cell and 2 mg. of albumin per hundred cubic centimeters.

Autopsy was refused. In this case the clinical picture was typical of that described by Kühnel [10] and others as complicating arsenical therapy of syphilitic pregnant women.

CASE 7.—*Acute encephalopathy. History.*—A white woman aged 31 reported for antepartum supervision in the sixth month of her fourth pregnancy. She gave no history of syphilitic infection or of previous treatment, but four consecutive serologic tests of the blood were reported to show medium positive Kolmer, Wassermann and Kahn reactions between Aug. 26 and Sept. 16, 1933. On the basis of these tests a diagnosis of latent syphilis of unknown duration was made and treatment started. The Wassermann reaction had been negative in 1930.

Antisyphilitic Therapy.—Neoarsphenamine 0.3 Gm. September 23 and 0.45 Gm. September 30 was given.

Course.—The night following the second injection she had a severe headache and high fever but the next day she felt better. October 2 she again felt dizzy and she went to bed and slept. On awaking she found that she could not talk and was too weak to get up, and when she attempted to move she had a convulsive seizure involving the left side of the body. She was admitted to the hospital the same day and showed left hemiplegia. It was the opinion of the syphilologic staff that such a lesion could have been caused by cerebrovascular therapeutic shock (Herxheimer reaction). She died October 4. Before death her temperature rose from 98 to 104 F. and the blood pressure from 104/80 to 150/100. The urine showed a cloud of albumin during the febrile period; the blood, 124 mg. of sugar and 24.7 mg. of urea nitrogen per hundred cubic centimeters. In the cerebrospinal fluid the colloidal goid curve was 0000000000, the Wassermann reaction negative and the pressure 8 mm. of mercury; there were 37 cells and 3 mg. of globulin per hundred cubic centimeters. It was felt that neither the symptoms nor the laboratory data were indicative of toxemia of pregnancy.

Autopsy was refused. This case likewise would seem to be one of a cerebrovascular lesion resulting from arsenical therapy during pregnancy.

COMMENT

A critical analysis of the medical handling of the foregoing forty-two cases of maternal death following antisyphilitic therapy during pregnancy reveals many interesting facts. The age of the patient and her parity apparently have little influence on the fatal termination. The fact that 31 per cent of the patients were under 21 and 69 per cent under 28 years of age is probably no more than a reflection of the truth that the young women bear the children and that the maximum incidence of syphilis in this country is between the ages of 21 and 28. It does suggest, however, that mere youth and the general appearance of physical well-being by no means exclude the possibility of a serious reaction to arsenical therapy. Only two of the patients were over 36 years of age. Multiparas and primiparas suffered almost equally, 58 per cent of the former and 42 per cent of the latter comprising this series.

TABLE 4.—*Type of Infection at the Onset of Antisyphilitic Therapy in Forty-Two Fatal Cases*

Syphilitic	Number	Percentage
Symptomatic early (primary or secondary)	16	38.1
Latent of less than four years' duration	4	9.5
Latent of more than four years' duration	7	16.7
Latent (duration unknown)	13	30.9
Symptomatic late	1	2.4
Nonsyphilitic	1	2.4
	42	100.0

An analysis of the statistics, moreover, with regard to the duration of syphilis at the time of the onset of therapy reveals the surprising fact that in almost one half of the cases the physician was concerned with early syphilis, primary, secondary or latent of less than four years' duration (table 4). In more than half of the remaining cases the disease was a symptomless infection of unknown duration, so that in actuality in only eight instances (19 per cent) was the disease known to be more than four years old. Death resulted in one case in which syphilis had not been proved, therapy being administered merely because the husband was found to be infected. Instances of this sort and like case 4 bring into serious question the advisability of intensive arsenical therapy when the chances of infection of the child are so meager, even though the prospective patient gives outwardly the appearance of a good treatment risk. Although the series of cases was too small to permit of any sweeping conclusions, it is worth while to note in this connection that the fifty-two mothers in the Cooperative Clinical Group [6] study who became pregnant after having had sufficient treatment to be considered "cured" had no syphilitic children among those born up to fifteen years after infection,

even though not treated during each subsequent pregnancy. Hoffmann's [36] considerable experience in this regard should also be considered. He said "A new course of treatment is not necessary in later pregnancy in women who have been treated intensively and systematically and whose cure may be assumed with sufficient probability."

Of this series of fatal cases treatment was started during the first four calendar months in 12 per cent, during the fifth or sixth month in 41 per cent and after the sixth month in 47 per cent. This again is nothing

TABLE 5.—*Number of Arsenical Injections After Which First Clinical Symptoms Appeared in Forty-Two Instances of Maternal Death*

Number of Injections	Cases	Percentage
One	5	11.9
Two	19	45.2
Three	10	23.8
More than three	8	19.1
	42	100.0

more than a confirmation of the circumstance frequently noted before in the literature, that pregnant syphilitic women report for antisyphilitic therapy late in pregnancy. It is usually necessary as a result of this to commence treatment when the physical burden of the woman in bearing her child is already well advanced. Only eight (19 per cent) of these patients had had antisyphilitic treatment prior to the pregnancy, two (4.7 per cent) had received more than twenty arsenical injections and six (14.3 per cent) had received less than this amount.

This fact brings up at least three important points for consideration: (1) preparatory treatment, (2) the question of individual intolerance or idiosyncrasy and (3) the ability of the already burdened pregnant woman to cope with the additional strain of antisyphilitic therapy.

When it is considered that one third of these women presented symptomatic early syphilis (primary or secondary) during their pregnancy and that only two showed evidence, either clinically or pathologically, of any serious late complication of the disease, it is probable that in most instances preparatory treatment with a heavy metal (a mercury or a bismuth preparation) prior to the institution of arsenical therapy was seldom seriously considered. Thirty-nine per cent of the patients received some preparatory treatment and 61 per cent none. It should, however, be pointed out that attempts to prepare patients for arsenical therapy have been inadequate, consisting for the most part of one or two injections of a heavy metal or their equivalent at from five to seven day intervals. According to present notions no less than from two to three weeks' treatment with a water-soluble heavy metal mercury or bismuth preparation in an adequate dose two or three times weekly or three or four weekly injections of an oil-suspended preparation (e. g. bismuth subsalicylate) could be expected to offset the shock of onset of arsenical therapy.

One of the most striking features of the entire analysis is the revelation that 81 per cent of these fatal treatment reactions were precipitated by three or less arsenical injections (table 5). In the majority of the remaining cases death resulted from damage to the liver, changes in the bone marrow or complications of exfoliative dermatitis which not infrequently require a number of days for development of clinical symptoms. Death likewise has been a matter usually of only hours or days (table 6). In only two instances in the series could the dose of the drug employed have been considered excessive, and this not markedly so (e. g. 0.5 Gm. of neoarsphenamine at five day intervals). Death following shortly after a single arsenical injection brings up for consideration the possibility of atopic drug allergy, and instances in which the symptoms with fatal termination followed closely the second or third injection suggest sensitization (acquired allergy). Such speculation finds further confirmation in the pathologic observations in many of these cases, consisting only of extreme peripheral congestion of acute circulatory collapse, with the hemorrhagic phenomena in the brain and other organs of capillary anoxemia or intoxication and increased permeability of the vessel walls. Whether the pregnant woman is more susceptible to the major and minor complications of arsenical therapy than the nonpregnant one is a matter on which there is still considerable difference of opinion among physicians. I feel that I have advanced evidence from my personal experience and from the literature which would indicate that at best the pregnant syphilitic woman is only a moderately good risk for arsenical therapy. Certainly principles of treatment which would be considered invalid for nonpregnant women (e. g. the onset of arsenical therapy in full dosage without adequate preparation in a case of late syphilis or of latent syphilis of unknown duration) should not be employed in the management of a syphilitic pregnant woman in the general haste and eagerness for protecting the unborn child.

Finally, both in the cases collected from the literature and in those reported locally there is much to indicate that the severity and the unusualness of the type of

TABLE 6.—*Time After Commencement of Arsenical Therapy at which Clinical Symptoms and Death Occurred*

Days After Onset of Arsenical Therapy	First Clinical Symptoms		Death	
	Number of Cases	Percentage	Number of Cases	Percentage
−1	1	2.4	1	2.4
2 to 7	14	34.1	9	21.4
8 to 14	10	24.3	12	28.6
15 to 28	9	22.1	13	30.9
28+	7	17.1	7	16.7
	41	100.0	42	100.0

treatment reactions described in this paper, occurring usually in an obstetric service, resulted too often in an unwarranted delay and at times in almost complete omission of recognized emergency therapy. While this is neither the time nor the place for a detailed discussion of the management of severe arsphenamine reactions, it cannot be overemphasized that if colloidoclastic shock, for example, is to be successfully combated, a matter of a few minutes hesitation in the onset of treatment with warmth and slow intravenous administration of dextrose (from 10 to 15 per cent solution) may be crucial. With hemorrhagic encephalitis epinephrine therapy with venesection and spinal drainage is successful ordinarily only when commenced before repeated convulsive seizures develop and before the

36. Hoffmann, Erich: Congenital Syphilis: In the Light of Thirty Years' Investigation of the Spirochete and Twenty-Five Years' Experience with Salvarsan, J. Pediat. **9**: 569 (Nov.) 1936.

patient becomes comatosed. These severe treatment reactions are to be considered extremely serious but never hopeless if handled with dispatch.

SUMMARY

Statistics taken over a five year period in a large general hospital where the general principles involved in the teachings of the Cooperative Clinical Group on the management of syphilis in pregnancy are rigidly adhered to would indicate that under certain circumstances or with certain classes of patients during pregnancy there is a markedly greater incidence of treatment reactions than with other reported groups.

That this higher incidence of treatment reactions is not a peculiarity of the institution from which this series emanates is suggested by the seven maternal deaths from antisyphilitic therapy reported from six different sources to the Committee on Maternal Welfare of the Philadelphia County Medical Society since 1931.

An analysis of the statistics pertaining to the thirty-five additional deaths collected from the literature indicates that the pregnant woman is not exempt from any of the severer types of treatment reaction, hemorrhagic encephalitis, acute circulatory collapse, damage to the liver, arsphenamine dermatitis and aplastic anemia all having occurred with fatal termination. There is, moreover, evidence to indicate that antisyphilitic therapy may aggravate an already existing toxemia or precipitate an incipient one.

This presentation is not intended in any way to depreciate the value of antepartum antisyphilitic therapy in protecting the unborn child in utero. All the authoritative literature indicates that at present the treatment of infected pregnant women forms one of the best imaginable fields of preventive medicine.

The added impetus of the public health movement for control of venereal disease, and especially the attention directed toward syphilis in pregnancy by the numerous state antepartum and premarital Wassermann laws under discussion, will tend of necessity, for a time at least, to direct the treatment of many syphilitic pregnant women away from the medical specialists in this field. While it is undoubtedly true that, with a rare degree of intuitiveness, individualization and attention to detail such as may be expected from the expert it is possible safely to treat syphilitic pregnant women with arsenicals, the facts contained in this study would seem to suggest that it is hardly proper to state that these women tolerate such therapy as well as or better than average.

The fact that these unfortunate symptoms have tended to occur among young patients with early or symptomless syphilis indicates that even with such patients, who if not pregnant would be expected to tolerate active therapy well, it is advisable to administer arsenical treatment cautiously, starting with small doses and gradually increasing them. Moreover, since for the pregnant woman the drug is ordinarily not curative but prophylactic for her child, it would possibly be advisable to give more consideration to adequate preparatory heavy metal therapy before commencing active arsenical treatment, even though one is confronted with an early infection in late pregnancy.

In addition, the question is raised as to whether active arsenical therapy is indicated at all during pregnancy unless there is reasonable assurance that the prospective infant has a strong chance of being diseased.

REDUCTION OF MATERNAL MORTALITY IN CLEVELAND

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CLEVELAND

Has there been an actual reduction in the maternal mortality rate in Cleveland or only a fictitious one? The answer requires a critical analysis of all the factors involved: socio-economic conditions, completeness of vital statistics, changes in classification, medical and nursing technics and adequacy of hospital facilities. Changes in the birth rate and movements of population also enter into the problem.

Prior to 1931 Cleveland, in company with other cities of comparable size, exhibited considerable variation from year to year in official maternal mortality rates (table 1). The rate varied irregularly from 4.3 to 7.2 deaths per thousand registered live births. Careful analysis of the vital statistics for the period from 1910 to 1930 indicates, as the main factors which account for

TABLE 1.—*Maternal Mortality (Number of Deaths from All Puerperal Causes per Thousand Live Births) in the Thirteen Largest Cities of the United States, 1928-1937*

According to data furnished by the United States Bureau of the Census.*

City	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937*
Baltimore	6.8	5.8	6.1	7.7	5.9	5.5	6.2	6.3	4.9	3.4
Boston	7.2	7.1	7.6	8.2	7.3	7.1	5.7	5.7	5.6	4.1
Buffalo	7.5	7.9	6.8	9.3	7.8	8.1	8.2	6.0	6.7	4.2
Chicago	5.6	6.5	5.1	4.9	5.2	5.0	4.8	4.0	4.3	3.3
Cleveland	6.1	6.7	6.5	7.2	5.7	6.2	5.4	6.1	4.0	3.7
Detroit	7.0	7.1	6.6	6.2	6.9	7.0	5.5	6.4	5.2	3.5
Los Angeles	6.5	6.4	6.5	9.2	6.8	6.4	5.1	6.2	5.8	4.3
Milwaukee	6.4	5.2	5.2	4.9	3.8	4.7	4.2	3.5	3.1	4.0
New York	5.4	5.2	5.3	5.8	5.6	6.2	4.9	5.3	4.7	4.0
Philadelphia	6.6	7.4	6.4	6.8	6.6	5.2	5.8	5.2	5.8	3.8
Pittsburgh	9.2	8.5	8.8	8.6	8.7	6.3	8.3	7.4	5.7	4.2
St. Louis	6.1	6.2	5.6	7.0	5.7	5.5	6.9	4.3	5.2	3.9
San Francisco	5.5	6.5	5.1	5.1	4.5	3.2	4.3	4.2	2.6	3.7

* 1937 rates based on data furnished by each city.

this irregularity, (1) incompleteness and irregularity in the reporting of births and the misinterpretation of stillbirths, (2) a declining birth rate due to later marriages, contraception and induction of abortions, (3) inaccuracy in reporting the causes of maternal mortality and obscuring of puerperal deaths under classifications which do not readily reveal the puerperal nature of the disease, (4) changes in obstetric technics and nursing procedures, (5) availability and acceptance of antepartum care and instruction, (6) availability and use of well equipped hospitals, (7) intercurrent epidemics of diseases such as influenza, which bear most heavily on puerperal women, and (8) fundamental changes in the socio-economic order.

Before 1931 little attention was paid to underlying conditions influencing maternal mortality rates. In 1931 the Cleveland Child Health Association undertook a complete and detailed study of every puerperal death occurring in Cleveland. This study[1] revealed the following facts:

1. Deaths due to abortion made up one third of the puerperal deaths in 1931; in over 70 per cent of the

Read before the Child Hygiene Section of the American Public Health Association, Kansas City, Mo., Oct. 26, 1938.

1. Bolt, Richard A.: Maternal Mortality Study for Cleveland, Ohio, Am. J. Pub. Health **23**: 109 (Feb.) 1933; Maternal Mortality Study for Cleveland, Ohio, Am. J. Obst. & Gynec. **27**: 309 (Feb.) 1934.

cases sepsis was the primary cause of death. In classifying puerperal deaths a distinction should be made between those involving a viable and those involving a nonviable fetus, a convenient dividing line being placed at from twenty-six to twenty-eight weeks of uterogestation.

2. Puerperal sepsis, the toxemias and hemorrhages were the major causes of death and were associated largely with hurried, operative and bizarre obstetrics.

TABLE 2.—*Principal Causes of Puerperal Deaths, Arranged in Order of Their Importance, Cleveland, 1930-1937*

According to an analysis of the Cleveland Hospital Obstetric Society.

		Number of Deaths	Percentage of Total
1	Abortion	151	22.53
2	Postpartum infection	103	15.37
3	Late toxemia	80	11.94
4	Hemorrhage	60	8.95
5	Ectopia	49	7.31
6	Other causes	41	6.12
7	Septic embolus	34	5.75
8	Heart disease	30	4.48
9	Early toxemia	29	4.33
10	Antepartum pneumonia	26	3.88
11	Shock	20	2.98
12	Postpartum pneumonia	19	2.83
13	Anesthetic	14	2.09
14	Nonseptic embolus	14	2.09
	Total number of puerperal deaths	670	100%

3. The maternal mortality rates varied markedly from hospital to hospital, depending on the nature of the hospital, composition of the staff, routines employed and selection of cases. The hospitals giving only maternity care showed the lowest rates. General hospitals with properly equipped and isolated maternity wards or private pavilions had the next lowest rates. The City Hospital, to which all types of patients are referred, including a considerable number of Negroes and persons from the lower economic areas, had the highest maternal mortality.

4. The midwife played a very small part in contributing to the puerperal death rate.

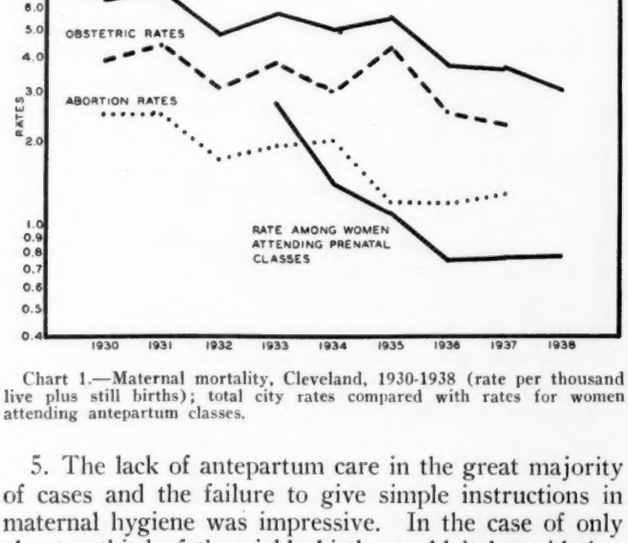

Chart 1.—Maternal mortality, Cleveland, 1930-1938 (rate per thousand live plus still births); total city rates compared with rates for women attending antepartum classes.

5. The lack of antepartum care in the great majority of cases and the failure to give simple instructions in maternal hygiene was impressive. In the case of only about a third of the viable births could it be said that adequate antepartum care had been given.

There had been considerable improvement in the registration of births in Cleveland during the twenty-five years prior to 1931, so that in 1931 it was estimated that at least 98 per cent of all births were registered. At present approximately 99 per cent of all births are registered. However, there still remained considerable room for improvement in the medical certification of the causes of puerperal deaths, especially as to the relative importance of primary and secondary causes. Our study revealed that in more than 30 per cent of the cases the cause of death was not stated properly on the death certificate so as to facilitate exact classifications. A check of the death certificates of every woman dying between the ages of 15 and 45 revealed that 28 per cent more deaths occurred from causes connected with childbirth than could be discovered through the official reports.

In many cases it was not possible to discover the exact cause of death without an intimate study of the personal, clinical, hospital and nursing history. This of course required the closest cooperation from hospital, doctor and nurse. The information could be obtained more readily when the death occurred in a hospital, but it was possible to secure fairly accurate information when the patient was delivered by a private physician in the home and even in the midwives' cases and those in which the coroner was involved.

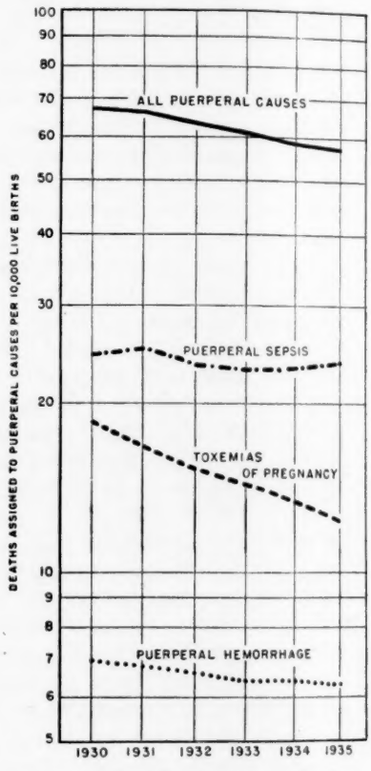

Chart 2.—Maternal mortality, 1930-1935, for the United States birth registration area of 1930 (the entire United States except South Dakota and Texas); deaths assigned to puerperal causes per 10,000 live births. Charts 2 and 3 are from the Children's Bureau, United States Department of Labor; source, United States Bureau of the Census.

March 29, 1933, the results of this study were presented to the Obstetrical and Gynecological Section of the Cleveland Academy of Medicine. The Academy of Medicine and the Division of Health took an active interest in them. A number of the chiefs of obstetric divisions of the Cleveland hospitals came together for mutual counsel as to what should be the next steps in the program. The feeling was expressed that if representatives from the obstetric staffs of each of the major hospitals would meet regularly and bring before the group case histories of women dying in hospitals from any puerperal cause, these could be discussed freely item by item and a careful analysis made of all contributing factors. This would lead naturally to an appraisal as to the preventability or nonpreventability of the puerperal deaths.

Out of the deliberations of this group arose the Cleveland Hospital Obstetric Society. The society adopted a classification of puerperal deaths based mainly on the clinical history. The causes of death are listed under sixteen different items, with qualifying classifications to clarify the factors associated with the death. Deaths

following abortions prior to six and one-half months of pregnancy are differentiated from those which occur when the fetus is viable, the so-called obstetric deaths. The toxemias are divided into early and late toxemias, and emboli are designated as nonseptic or septic. Antepartum and postpartum infections are separated whenever possible (table 2). A study has been made of the

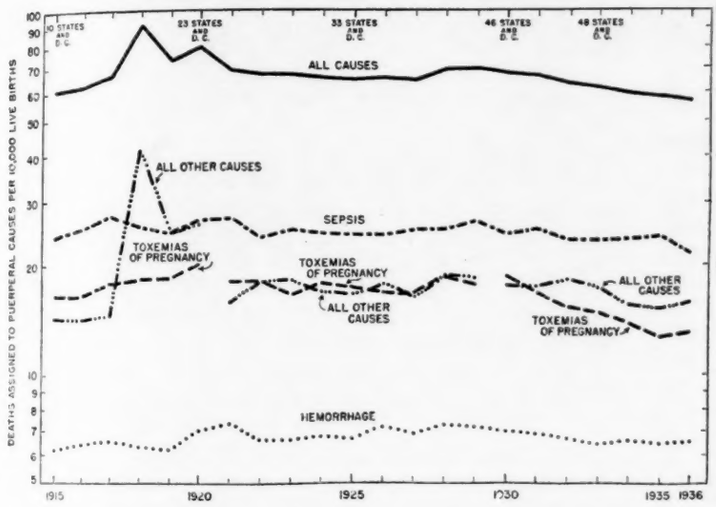

Chart 3.—Maternal mortality by cause, 1915-1936 (United States expanding birth registration area); deaths assigned to puerperal causes per 10,000 live births. The breaks in the lines are due to changes in the conditions included in the international list titles.

deaths in cases in which disease was proved to exist on entrance to the hospital.[2]

In 1934 a statewide organization was formed. The Hospital Obstetric Society of Ohio held its first regular meeting in Columbus, May 5, 1934. The program and recommendations presented by its president were adopted as guiding principles for each of the hospitals subscribing to its standards. July 21, 1937, the society adopted obstetric standards for group 1 and group 2 hospitals to strengthen the setup in the various hospitals, making for better administration, housing, staff arrangements and follow-up of all obstetric patients.[3]

The forty-five hospitals now members of the Ohio society prepare detailed monthly reports. The Bureau of Child Hygiene of the Ohio Department of Health has attached a statistician from its staff to the society to devote his full time to the study and classification of the reports dealing with the exact causes of deaths associated with pregnancy. It is hoped that the correlation of the known facts will lead to preventive measures which will save many lives.

There is no question that the efforts of the society have been instrumental in improving the practice of obstetrics in hospitals throughout the state. It must be clearly understood, however, that even before its organization Cleveland had an ample number of obstetric beds in well conditioned hospitals, the services being under competent supervision. The midwife had played only a minor part in maternal mortality, as the percentage of midwives' cases had decreased gradually from 6 in 1930 to 1 in 1937.

For many years the Maternity Hospital, now one of the university hospitals of Cleveland and the teaching obstetric hospital for Western Reserve University School of Medicine, has maintained antepartum centers in various sections of Cleveland for service to mothers in the lower economic levels. These clinics have made possible excellent antepartum medical and nursing services and care at delivery in Maternity Hospital, City Hospital or the patient's home. They reach approximately one third of all child-bearing women in Cleveland each year.[4]

The Visiting Nurse Association of Cleveland also has played a prominent part in the maternity program for many years. It sends out trained nurses to render service in the home, free to those who can pay nothing and part pay and full fee to those who can afford fees. Pregnant women are referred to the Visiting Nurse Association through private physicians, relief agencies, insurance companies, the Maternity Hospital Dispensary and sometimes by the family itself. The association follows up all postpartum calls for Maternity Hospital.

Antepartum calls of visiting nurses to patients of private physicians usually come late, as the family frequently does not call the doctor until the later months of pregnancy. The value of this service is enhanced when the physician refers his patient early. The services were organized primarily to care for the individual needs of the patient and to give individual instruction.[4]

There has been another community-wide development—group instruction of expectant mothers—which undoubtedly has played a material part in the reduction of maternal mortality in Cleveland.[5] In large antepartum clinics physicians and nurses find little time to give individual instruction. It was felt that instruction

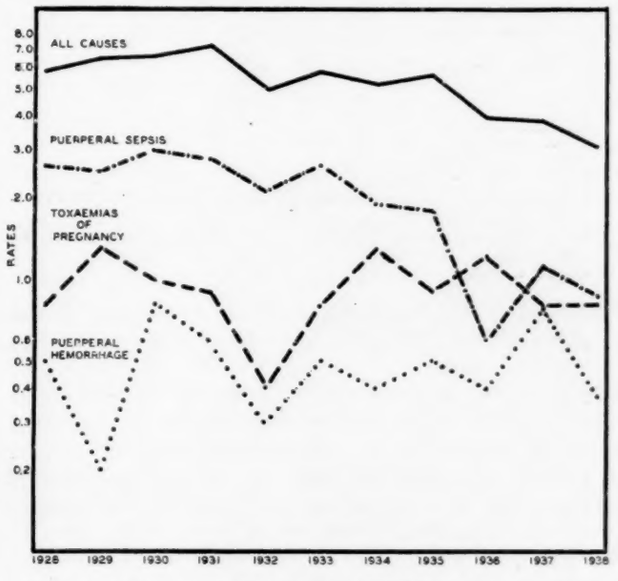

Chart 4.—Maternal mortality, Cleveland, 1928-1938; rates per thousand live births.

which might be given to women in groups would have a distinct bearing on the cooperation with the physicians and greater regularity of attendance at the antepartum clinics and secure closer check-ups at delivery than otherwise might be the case. Accordingly, in 1922

2. The Classification of the Hospital Obstetric Society of Ohio (mimeographed), obtainable from Dr. Scott C. Runnels, Secretary, Ohio Hospital Obstetric Society, 9400 Euclid Avenue, Cleveland.

3. Obstetrical Standards for Group I and II Hospitals (printed sheet), obtainable from Dr. Runnels.

4. Maternity Care for Cleveland Women, Child Health Bull. 5:1 (Jan.) 1938; Cleveland, Cleveland Child Health Association.

5. Galdston, Iago: Maternal Deaths—The Ways to Prevention, New York, Commonwealth Fund, 1937, appendix, pp. 94-110.

antepartum group instruction was instituted by Mrs. Ellen D. Nicely, nurse director of clinics, in the antepartum clinics of the University Public Health Nursing District.

The time of groups of mothers who were waiting their turn to interview the doctor in the clinic was occupied in listening to the nurse explain in simple language matters of hygiene, nutrition, clothing and infant care. This program was developed further under the Cleveland Health Council and the Maternity Hospital, and in 1932 it came under the direction of the Cleveland Child Health Association, where it has developed rapidly.

TABLE 3.—*Living Births According to Place of Birth (at Home or in a Hospital) Cleveland, 1930-1937*

Year	1930	1931	1932	1933	1934	1935	1936	1937
Total for city	17,895	16,279	15,122	13,716	14,225	14,566	14,354	14,745
Total at home*	7,416	6,516	5,764	5,237	4,822	4,430	3,882	3,358
Total at a hospital	10,479	9,763	9,358	8,479	9,403	10,136	10,472	11,387
At maternity hospitals (exclusively)	3,732	3,519	3,151	2,904	3,147	3,310	3,325	3,732
1	64	71	90	160	227	328	354	341
2	15	11	14	15	9	13	16	14
3	55	32	50	49	35	48	45	62
4	2,293	2,057	1,876	1,732	1,793	1,855	1,815	1,993
5	20	16	15	29	16	5	4	0‡
6	1,285	1,332	1,106	1,009	1,066	1,061	1,091	1,322
At general hospitals with maternity licenses	6,738	6,235	6,199	5,472	6,236	6,813	7,142	7,649
7	..	..	..	..	..	..	..	38
8	56	19	..	..	..	..	..	..
9	836	832	1,465	1,391	1,386	1,491	1,336	1,332
10	65	56	65	40	67	58	61	78
11	11	12	8	6	6	3	2	4
12	91	73	66	49	54	48	63	32
13	36	19	22	22	25	18	20	23
14	456	502	419	343	446	493	607	693
15	26	25	7	5	..	..	..	..
16	377	371	333	274	337	377	451	445
17	28	31	1	..	..	..	..	..
18	314	272	212	169	257	408	487	600
19	279	237	280	222	276	330	(706)‡	(1,002)†
20	514	485	383	434	575	669	716	803
21	635	562	564	447	583	630	660	637
22	..	..	..	..	..	..	..	1
23	..	..	..	..	..	..	..	50
24	..	..	..	..	..	6	49	69
25	188	247	205	160	187	226	272	310
26	152	134	93	87	106	74	33	..
27	828	737	660	667	644	647	717	780
28	1,183	1,192	978	818	921	1,097	1,305	1,379
29	663	429	418	338	366	338	363	375
At nonmaternity hospitals	9	9	8	13	20	13	5	6
30	1	1	2	1	1	2	0	2
31	3	1	2	..	1	3	2	2
32	1	..	..	..	..	..	..	..
33	..	..	..	..	..	1	..	..
34	1	2	1	1	1	1	..	..
35	1	2	1	5	15	2	1	2
36	2	1	1	3	1	4	2	..
37	..	..	..	1	..	..	..	..
38	..	2	1	2	1	..	..	..

* "Other" cases included under "total at home."
‡ Moved to East Cleveland Aug. 13, 1935, and therefore not included in totals for city of Cleveland.
† Closed in 1937.

It began to be recognized that group instruction in antepartum care was just as important for the patients of private physicians as for those attending the clinics. In 1933 an experimental class for private patients was organized by the Cleveland Child Health Association in the headquarters of the Academy of Medicine of Cleveland. This proved immediately successful, and several more such classes were opened in other sections of the city. Since 1933 the antepartum lectures and craft classes have been open to any woman in greater Cleveland who wishes to avail herself of their advantages. At present 100 classes a month are being conducted, forty for the patients of private physicians and sixty for patients at clinics.

The Academy of Medicine of Cleveland has assumed joint sponsorship of the classes [6] for the patients of private physicians. No patient is accepted without an admission card signed by her physician signifying his approval. Patients of more than 300 private physicians have registered in the classes in the past five years.

An important feature of this development has been the mothercraft classes, in which the women are taught to make practical layettes at small cost. If a mother has some special problem, the instructor arranges time for a personal conference. Sometimes fears or superstitions trouble the mother and she is too timid to consult her doctor. In such cases the instructor tries to put her in a proper frame of mind to consult her physician. Our experience has been that these classes and personal conferences are of great value, as they ease the mind of the expectant mother, giving her a clear picture of what is before her and of many things that have appeared vague. Furthermore they make possible a check of her simple disorders and unfavorable signs and place the instructor in a position to refer her immediately to her family physician or obstetrician for observation and treatment.

Year by year the women are coming to the classes earlier in pregnancy and are attending more and more of the lectures. In the past five years there has been a gain from 11 to 17 per cent in the number of women registering in the classes during the first three months of pregnancy and a gain from 58 to 65 per cent in the number registering before the seventh month.

About 94 per cent of the patients of private physicians in the classes are primiparas, and they of course are exposed to the greatest obstetric risks. About 40 per cent of the patients of clinics are primiparas.[7]

Experience has led to the belief that the first consideration in any program for the reduction of maternal mortality is the puerperal woman herself. Her ability to choose a skilful physician, a competent nurse and a well conditioned hospital are of vital importance. Her capacity to grasp and to carry out simple hygienic rules and her teachability as to the importance of symptoms and signs which indicate approaching danger are large factors. Group instruction in antepartum care, given

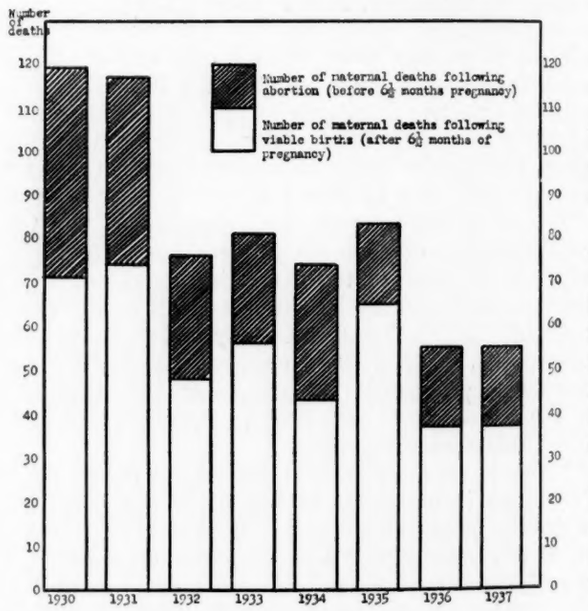

Chart 5.—Number of maternal deaths, Cleveland, 1930-1937 (total deaths, obstetric deaths and deaths due to abortion).

6. Prenatal Classes Approved, Bull. Acad. Med. Cleveland **19**: 7 (April) 1935.

7. Evaluation of the Prenatal Group Instruction Program in Cleveland, Ohio (mimeographed), Cleveland, Cleveland Child Health Association, 1938.

by competent public health nurses under the direction of a physician, is proving a successful method of reaching and teaching these essentials to the expectant mother.

When one segregates the women who attended the antepartum classes in Cleveland from the total number of women confined in the city, one finds that the maternal mortality rate in 1933 for the former group was 2.8 deaths per thousand live plus still births and for the women not attending the classes was 5.9. In 1937 the rate for the 2,524 women from the antepartum classes who were confined was only 0.78, as compared with a rate for those not attending the classes of 4.2 deaths per thousand live plus still births (chart 1).

A factor of equal if not greater importance is the type of physician selected to conduct the woman safely through her pregnancy. So long as there are physicians who have been poorly trained and who are making midwifery only a small part of their general medical care. *Failure of proper lay cooperation is responsible for about 50 per cent of the preventable deaths among mothers"* (italics by author).

Comparison of statistics in the 1931 Cleveland study with recent figures furnished by the Academy of Medicine reveal that there has been a trend in Cleveland away from the general practitioner who handles few cases to the physician with a large obstetric practice and to the obstetrician.

The next important factor in the prevention of maternal mortality is the well equipped and properly staffed maternity hospital or maternity division of the general hospital, competently administered under safeguards such as those laid down by the Ohio Hospital Obstetric Society.[3] Studies in Cleveland clearly indicate that the improvements in hospital facilities, in better coordination of visiting and courtesy staffs and in the setting up of high obstetric standards have accompanied the reduction in maternal mortality. One general hospital, which was formerly in Cleveland, has moved to

TABLE 4.—*Maternal Mortality by Cause, Cleveland, 1928-1937*

	International Classification of 1920				International Classification of 1929					
	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937
All causes	104*	113*	119*	117*	76	81	74	83	55	55
Puerperal sepsis	47	43	53	47	32	36	28	26	9	15
140 Abortion with septic conditions	*	*	*	*	18	12	16	11	4	12
142a Ectopic gestation with septic conditions specified	*	*	*	*	0	2	2	0	1	0
145 Puerperal septicemia and pyemia (not specified as due to abortion)	47*	43*	53*	47*	14	22	10	15	4	3
All other puerperal causes	57	70	66	70	44	45	46	57	46	40
141 Abortion without mention of septic conditions (to include hemorrhages)	8	6	4	10	5	3	5	7	3	2
142b Ectopic gestation without mention of septic conditions	6	4	9	6	5	2	6	3	4	1
143 Other accidents of pregnancy (not to include hemorrhages)	1	1	1	2	0	0	0	0	0	0
144 Puerperal hemorrhage										
(*a*) Placenta praevia	10	3	14	10	0	3	1	3	1	5
(*b*) Other puerperal hemorrhages					5	4	4	4	5	6
146 Puerperal albuminuria and eclampsia	14	23	18	15	3	6	7	6	10	10
147 Other toxemias of pregnancy	*	*	*	*	3	5	8	7	5	2
148 Puerperal phlegmasia alba dolens, embolus, sudden death (not specified as septic)	5	11	8	11	7	12	6	10	3	4
149 Other accidents of childbirth	3*	8*	6*	9*						
(*a*) Cesarean operation	7*	12*	6*	5*	10	4	3	8	5	5
(*b*) Others under this title	3*	1*	0*	1*	5	5	6	7	10	5
150 Other and unspecified conditions of the puerperal state	0	1	0	1	1	1	0	2	0	0

* Cannot be compared on account of change of classification.

practice, thus having too few deliveries each year to give them experience in handling the more difficult and complicated ones, there will continue to be high rates. So long as the impression is given that a woman will receive adequate and skilful attention from any physician, just so long will there be complications. It is obvious that physicians having only ten or fifteen obstetric patients a year and hospitals in which less than 150 obstetric patients are confined each year cannot give all the detailed and skilful attention necessary in obstetric practice, especially to patients in whom complications develop.

Dr. Fred Adair[8] and his colleagues have pointed out recently the principles of management of some of the more serious complications of pregnancy. A study of these complications impresses one with the fact that had the women been in the hands of competent obstetricians from the earliest possible date in their pregnancies a considerable number of the complications would not have occurred and the maternal death rate would have been materially lowered. Dr. Adair stated that "women must be properly instructed in personal care and must be taught to cooperate with and appreciate the doctor who is trying to give good antepartum and delivery

8. Adair, F. L.: Maternal Care Complications, Chicago, University of Chicago Press, 1938, p. 74.

East Cleveland and developed a large obstetric division. There has been a trend toward more confinements in the larger, better equipped hospitals.

As a result several smaller hospitals have gone out of business or ceased to take obstetric patients. In 1931, 60 per cent of all registered births in Cleveland occurred in hospitals, while in 1937 the percentage had increased to almost 80 (table 3).

However, one must not lose sight of the fact that the mortality for normal obstetric patients delivered in their own homes by well qualified and experienced physicians remains remarkably low. The experience of the outpatient delivery service of Maternity Hospital in Cleveland reveals a similar low mortality for the patients delivered at home. A hospital may be the safest or the most dangerous place to have a baby, depending on the conditions mentioned. This does not militate against the organization of obstetric services in hospitals, as it is well known that the patients with difficult and complicated labor and a large proportion of primiparas are referred from home service into hospitals.

The physical and mental condition of the prospective mother has roots which reach back into early life and which are conditioned by heredity, disease affecting the bony system, especially of the pelvis, and disease affecting the circulatory, respiratory or endocrine sys-

tems. It is evident that a woman coming into pregnancy with a damaged heart or kidneys, with chronic tuberculosis or with a toxic thyroid will be a poor risk regardless of the medical, nursing and hospital attention given to her. Furthermore, a woman with a contracted pelvis due to rickets or achondroplasia already presents complications which may have to be dealt with operatively, and it is known that operative procedures increase risks. Therefore public health measures which reduce any of these hazards will add to the safety of the puerperal woman.

Another practical consideration in the obstetric situation is the financial ability of the family to meet the expenses for the physician and nurse for the confinement and for hospital care when that is desirable or essential. In Cleveland prospective mothers of the upper economic levels have been able to secure proper instruction in maternal hygiene and skilful medical, nursing and hospital attention. This group on the whole has the lowest birth rate and the lowest maternal mortality. Those in the lower economic levels and those on relief have been able to secure good obstetric service

Table 5.—*Puerperal Death Rates per Thousand Live Plus Still Births Cleveland, 1930-1937*

Year	Live Births	Still Births	Total Births	Total Puerperal Deaths	Rate
1930	17,895	705	18,600	119	6.4
1931	16,279	597	16,876	117	6.9
1932	15,122	591	15,713	76	4.8
1933	13,716	491	14,207	81	5.7
1934	14,225	520	14,745	74	5.0
1935	14,566	449	15,015	83	5.5
1936	14,354	476	14,830	55	3.7
1937	14,745	443	15,188	55	3.6

	Obstetric Deaths (After 6½ Months)		Deaths Due to Abortion (Before 6½ Months)		
1930	71	3.9	48	2.5	119
1931	74	4.4	43	2.5	117
1932	48	3.1	28	1.7	76
1933	56	3.8	25	1.9	81
1934	43	3.0	31	2.0	74
1935	65	4.3	18	1.2	83
1936	37	2.5	18	1.2	55
1937	37	2.3	18	1.3	55

through the Maternity Hospital outpatient department and through the maternity service at City Hospital.

On the other hand, a considerable number of prospective mothers in the middle class have found it extremely difficult to meet the expenses of a pregnancy. It is for this group, in which the husbands or the women themselves are employed as workers in shops, factories or stores, that the Hospital Service Association's provision for hospitalization of parturient women is a great boon. More than 155,000 persons are insured in the association plan, which allows twenty-one days of hospital care a year in one of sixteen approved Cleveland hospitals for a monthly premium of from 60 to 75 cents. April 1, 1938, the service was extended to include confinements for those participating in the plan for more than a year. In October the service was extended further to include the entire family. I am confident that in a few years, when full advantage is taken of these provisions, there will be a still further reduction in the maternal mortality rate in Cleveland. There will be greater improvement in technic in hospitals taking obstetric patients under the plan and a more judicious selection of obstetricians by the patients, who will plan early in pregnancy for confinement in one of these hospitals.

Unless the prospective mother can be impressed with the importance of an early choice of a skilful and conscientious physician and it is made possible for her to choose a physician from among the most competent obstetricians in the community, and unless it is made possible for those in the lower economic levels to obtain adequate medical, nursing and hospital care, a material reduction in maternal mortality rates cannot be expected. There may be adequate hospital facilities, a large enough number of physicians and obstetricians in the community and all the necessary nursing facilities, yet, if these cannot be brought to bear directly on the prospective mother at every economic level, other efforts will prove fruitless. The maternal mortality rate will be reduced only in proportion to the community organization which assures the coordination of all these forces.

Accurate reporting of births and deaths is essential to any appraisal and comparison of mortality rates. It must be recognized that a comparison of the rates of one city with those of another and with state and national statistics requires careful interpretation. In the state department of health a reclassification of data submitted by cities may take place because of differences in interpretations and the system of tabulation. By actual comparison it was found that the official rates submitted by cities differed slightly from those furnished by the United States Bureau of the Census in practically all instances. In a comparison of the maternal mortality rates in cities over a period of years, the official rates as issued by the Bureau of the Census are the only ones that are comparable.

Since the adoption of the "1929 International Classification of Causes of Death" by the Cleveland Bureau of Vital Statistics (in 1931) it has been possible to secure the segregation of abortions accompanied with septic conditions from abortions without mention of septic conditions. Other improvements have been made in that classification, but it still does not cover all the points necessary to a complete evaluation of the preventability of maternal deaths. However, the Cleveland Bureau of Vital Statistics has made marked strides in the direction of securing completeness of registration of puerperal deaths, especially in the hospitals, through the cooperation of the Hospital Obstetric Society, and also has checked all cases of obscure causation, so that today the picture from official sources is much more reliable than it was prior to 1931 (table 4).

With the demographic studies of Howard Whipple Green [9] in connection with economic areas in census tracts, one is able to evaluate socio-economic factors entering into the problems of maternal and infant mortality. The data all lend greater reliability to the Cleveland figures for the past eight years and make a comparison of trends more reliable.

The birth rate has varied but little in Cleveland since 1933. The character of the population has remained about the same, although there have been fluctuations in the number on direct and on work relief. There have been no serious epidemics that might have affected the maternal mortality.

As a result of the studies made of maternal mortality, it may be stated that there was no demonstrable downward trend in the official puerperal mortality rate in Cleveland from 1910 to 1931, the yearly rate fluctuating irregularly between 4.3 and 7.2 deaths per thousand live births. From 1931 to 1938 there was a decided downward trend in the maternal mortality rate, with minor yearly fluctuations, from 7.2 in 1931 to

9. Green, Howard W.: Demographical Data, Cleveland, Ohio, 1931 to 1937, Cleveland, Cleveland Health Council, 1938.

3.7 in 1937 and 2.9 for the first seven months of 1938. One may reasonably compare the rates since 1930, and especially since 1933 (table 1), because it is known that the registration of births and deaths has become more complete, that the classification of causes of death has become more exact and that more detailed studies of hospital deaths have taken place (table 4).

If the classification of the Cleveland Hospital Obstetric Society is adopted, the favorable change in rates is brought out even more clearly. In 1931 the rate per thousand live plus still births for patients more than six and one-half months pregnant was 4.4, while the rate for those dying before they were six and one-half months pregnant, this figure, including all deaths registered as due to abortion, was 2.5. In 1937 these rates had dropped to 2.3 and 1.3 (table 5 and chart 5).

The answer then to the question as to whether there has been an actual reduction of maternal mortality in Cleveland is Yes. It remains to state that maternal mortality rates in other large cities have been falling to new lows. There has been a general decline in the maternal mortality rates throughout the country. It would be valuable to have the experiences of other cities analyzed and presented to the American Public Health Association.

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FACTORS ASSOCIATED WITH FETAL AND NEONATAL DEATHS

ANALYSIS OF 773 SUCH DEATHS OCCURRING IN 17,728 DELIVERIES AT THE CHICAGO LYING-IN HOSPITAL

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In the past few years there has been an increasing recognition of the need for further investigation of the factors associated with death of the fetus in utero and during delivery and of the infant in the first few days of life. Attention for some time has been focused on the older infant, with the result that deaths occurring in the period from the end of the first month to the end of the first year of life have been greatly reduced (100 per thousand live births in 1915 to 56 per thousand live births in 1935). The death rate in the first month has shown little reduction, while the rate for the first day of life and for stillbirths has remained practically stationary during the entire period since vital statistics on the subject have been collected.

Except for disorders arising from defects of the germ plasm, the welfare of the fetus and of the infant in the period immediately following delivery is largely dependent on the condition of the mother during pregnancy and on the character of labor. It is not until an independent existence has been completely established that pathologic conditions intrinsic in the infant become important lethal factors. The physician therefore must attempt to eliminate any maternal condition which might adversely affect the fetus during the prenatal period and ameliorate any harmful processes occurring during labor if the morbidity and mortality rates are to be decreased.

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It is believed that an analysis of conditions associated with fetal and neonatal death in a large series of deliveries in which the maternal complications and obstetric procedures employed are known, not only in those which die but also in those which survive, might enable one properly to evaluate the factors responsible for fetal and infant deaths.

Considerable difficulty is encountered in attempting to group causes of fetal death, and many classifications heretofore published consist of a mixture of fetal and maternal states. Craniotomy (unless performed on a live fetus), maceration, atelectasis and prematurity in stillborn fetuses are not causes of death and should not be listed as such. No single classification of pathologic conditions gives sufficient information with regard to the fundamental factors responsible for death, and it is only by multiple tables that adequate information can be obtained. In attempting to evaluate the various factors associated with fetal and infant mortality, it is important to know the pathologic conditions present in the fetus or infant, the effect that abnormal maternal conditions present before labor have on the fetus or infant, the effect of different types of labor and delivery on the fetus or infant, and the relation of maternal complications, type of delivery and cause of death to the period of gestation at which the fetus or infant is delivered. The causes of death will be presented from each of these points of view.

GENERAL PROCEDURE

The criteria used to determine the age of a fetus or infant are based on Scammon's figures for weight and length in relation to the menstrual age of the fetus. The fetus is placed in the group in which at least two of the three criteria apply.

I. Abortion:
   1. Less than 400 Gm. in weight.
   2. Less than 28 cm. in length.
   3. Less than 22 weeks (missed abortions are excluded).

II. Premature:
   A. Previable:
      1. From 400 to 999 Gm. in weight.
      2. From 28 cm. to 35 cm. in length.
      3. From the 22d to the end of the 28th week.
   B. Viable:
      1. From 1,000 to 2,499 Gm. in weight.
      2. From 35.1 cm. to 47 cm. in length.
      3. From the 29th to the end of the 37th week.

III. Term:
   1. From 2,500 to 4,499 Gm. in weight.
   2. From 47.1 cm. to 54 cm. in length.
   3. From the 38th to the end of the 42d week.

IV. Postmature:
   1. More than 4,500 Gm. in weight.
   2. More than 54 cm. in length.
   3. More than 42 weeks.

The law in the state of Illinois requires that the birth of all live infants and of stillborn fetuses which have advanced to the fifth calendar month of gestation be recorded. Therefore the birth of infants delivered between the fifth month and the period of viability (end of the seventh month) must be recorded, and these deaths must be included in the computation of mortality statistics even though there is no chance of a continued existence. Infants at the end of the seventh month weigh about 1,000 Gm. Many hospitals accept 1,500 Gm. as the lower limit of viability and disregard in statistical reports all infants below this weight. Dunham and her associates, however, found

in a study of more than 5,000 premature infants that, although 98.8 per cent of all infants weighing less than 1,000 Gm. at birth failed to survive, 35 per cent of those between 1,000 and 1,500 Gm. did survive. The deletion of this group of infants from statistical records cannot be justified on the ground that they are previable.

The product of conception is considered stillborn if it shows no sign of life at birth (heart beat, respiration, muscular movement)[1] and live born if the heart is beating when born, even though respiration is never established.

Autopsies have been performed on 68 per cent of the fetuses and infants delivered and dying in the Chicago Lying-in Hospital. Only too frequently autopsy fails to reveal the cause of death, but despite this, postmortem examination of the infant is as important in determining the absence of pathologic conditions as it is in establishing their presence. The maternal history is an extremely important adjunct to the autopsy protocol, and any statement as to the cause of death based on the summation of knowledge contained in a complete maternal history plus an accurate autopsy protocol is of inestimably more value than an opinion based on one alone.

An attempt has been made to group together closely related pathologic conditions in order to simplify the discussion. Most lesions sufficient to cause death fall into five major groups. They are (1) hemorrhage, either visceral or intracranial, usually caused by trauma, (2) anoxemia, (3) malformations, (4) infections and (5) idiopathic conditions. There are ordinarily no pathologic changes demonstrable in premature infants who die because of insufficient development. In the case of an infant delivered in the previable or viable premature period, prematurity is not given as a cause of death in the absence of pathologic changes, but the fact that it was born in the previable or viable premature period and that no pathologic lesions were found is stated.

Intracranial hemorrhage includes only those cases in which there was definite bleeding into the brain substance or cranial cavity. This bleeding is often associated with laceration of the supporting stuctures and in most cases is due to actual trauma. When there was slight extravasation of cells into the leptomeninges of the type so commonly seen in association with the extreme congestion produced by anoxemia, the infant was placed in the group dying from anoxemia and not with those having intracranial hemorrhage.

Anoxemia is considered the cause of death only when definite petechial hemorrhages are visible in the lungs, heart, thymus or meninges. Petechial hemorrhages when present in one organ are often present in all organs. They are most characteristic in association with death from premature separation of the placenta but usually occur in any obstruction of circulation through the cord or placenta. When death is due to anoxemia, epithelial cells and vernix caseosa derived from the amniotic fluid are demonstrable microscopically in the alveoli of the lungs in much larger quantities than when death occurs from other causes.

Malformations include only those defects which are in themselves capable of causing death. Even though there may have been coincidental maternal complications the malformation is given precedence as a cause of death over any maternal condition. Erythroblastosis has been included under this heading, since we believe that it is most probably a congenital maldevelopment of the hemopoietic system.

Infections are an extremely infrequent cause of death and in general are listed individually. Syphilis and pneumonia are the two most commonly encountered, and even these are rare.

Idiopathic conditions may include hemorrhagic disease of the newborn, glycogen storage disease (von Gierke's disease), hypoglycemia unrelated to maternal diabetes, edema of the brain and the like. Except for one case of hemorrhagic disease, edema of the brain was the only one of these conditions found in the present series. It occurred nine times and most frequently followed birth by cesarean section. Most of the infants died with clinical symptoms indicating increased intracranial pressure. It is not known whether death is due to increased fluid, but it seems wise to place these cases in a separate group since they showed no other pathologic changes.

Atelectasis (lack of expansion of the alveoli) has in no case been considered a cause of death. We believe that atelectasis is not the cause but the result of the processes which produce the death of the infant. It would be advantageous if a term could be introduced which would differentiate the atelectasis due to primary nonexpansion of alveoli and secondary collapse of alveoli due to resorption of air. The first is the type most commonly seen in newborn infants; the second is most often found after the first few days of life. Expansion of alveoli is a gradual process, and lungs of infants a few hours old normally contain less air than those several days old. Abnormal lack of expansion may be due to depression of the respiratory center (anoxemia, trauma, narcotics from the maternal circulation, cerebral malformations), local compression of the lungs (diaphragmatic hernia, polycystic kidneys, pleural effusion) or immaturity of the respiratory center, lungs and thoracic muscles. In none of these conditions is the unexpanded condition of the lungs the actual cause of death.

The role that analgesia and anesthesia play in producing fetal or infant death is extremely difficult to determine. The respiratory center of the infant may become so depressed by excessive or ill timed administration during labor that its function is inhibited and respiration sufficiently delayed to cause death. However, no pathologic lesions are ordinarily produced in the infant's body and it is usually impossible to prove that this was the actual cause of death.

GENERAL ANALYSIS

Since the opening of the new physical plant in May 1931 until Jan. 1, 1938, 17,728 infants have been delivered at the Chicago Lying-in Hospital. Of these 402 were stillborn and 371 died either before discharge from the hospital, or within ten days after birth. This is a total death rate of 21 per thousand live births and a stillbirth rate of 23 per thousand live births.

General Mortality in Relation to Age at Birth.—Among the total infants and fetuses delivered, the great majority (93.3 per cent) remained in utero a normal length of time, and only a small portion (5.8 per cent) were delivered during the viable premature period. Less than 1 per cent (0.5 per cent) additional were previable. The mortality for infants and fetuses at term is only 1.9 per cent, but for those born prematurely it is increased eighteen fold (34.6 per cent) and practically none born in the previable period survive (98.8 per cent).

1. Throughout this paper the term fetus is used to indicate a product of conception born dead at any period of gestation.

Among the infants born alive 94.4 per cent were at term, 5.3 per cent were viable premature infants and 0.3 per cent were previable. The mortality rate for infants at term is 0.8 per cent, for viable premature infants 18.1 per cent, for previable infants 96 per cent. Thus the term infant has twenty-one times more chance of surviving than does the premature infant.

A relatively greater proportion of the stillborn fetuses reached term before delivery (47.1 per cent) than did those infants who died in the neonatal period (35.8 per cent). The opposite is true in the viable premature period, for 42.2 per cent of the stillborn fetuses and 50.9 per cent of the infants dying neonatally fall in this group.

Although of all infants and fetuses delivered only 5.8 per cent were viable premature infants and 0.52 per cent were previable, there were more deaths in these two groups combined than there were among all those who were delivered at term. Only 41.6 per cent of the total deaths were in infants and fetuses at term, while 46.5 per cent occurred among those delivered during the viable premature period and 11.9 per cent were in those delivered during the previable period.

Time of Death in Relation to Labor in Stillborn Fetuses.—Death occurred before the onset of labor in half (50 per cent) of all stillborn fetuses and during labor in more than one third (35 per cent); the time of death was unknown or not recorded in 15 per cent. Sixty-two per cent of the fetuses that died during labor were at term in comparison to 39 per cent of those that died before the onset of labor. The actual number of term fetuses dying during labor is almost twice that of premature fetuses dying during labor. However, death occurred during labor in 5.1 per cent of the infants and fetuses delivered prematurely who were known to be alive at the onset of labor and in only 0.47 per cent of the infants and fetuses delivered at term. Thus the premature fetus has 10.8 times more likelihood of dying during labor than does the fetus at term.

Extra-Uterine Age at Death.—Of the 371 infants who died after birth, eighty-seven lived less than one hour (in the majority of these normal respiration was never established), 192 lived more than one but less than twenty-four hours and eighty-one lived from one to ten days, while eleven died after ten days. A total of 279, or 75.2 per cent, died within the first twenty-four hours of life. This indicates that some process intimately associated with intra-uterine life, the process of birth or the establishment of an extra-uterine existence was directly responsible for at least three fourths of all deaths.

Type of Delivery in Relation to Total Births.—Among the total infants and fetuses almost two thirds (61.7 per cent) were delivered in a cephalic position without operative procedures other than episiotomy. More than one fourth (27 per cent) were delivered in a cephalic position with the aid of forceps (low forceps in 22.4 per cent, mid forceps in 4.6 per cent). The breech was the presenting part in 4 per cent of all deliveries; cesarean section was the method of delivery in 5.8 per cent, and podalic version with subsequent extraction was performed in 0.9 per cent of all cases.

TYPE OF DELIVERY IN RELATION TO FETAL AND NEONATAL MORTALITY

The gross neonatal mortality (0.89 per cent) is less for cephalic deliveries aided by low forceps than for any other type of delivery. The next lowest figure is for infants delivered naturally in a cephalic position (1.5 per cent). Other operative procedures are associated with progressively greater mortality; mid and high forceps 2.4 per cent, cesarean section 6 per cent, breech delivery 7.9 per cent, version and extraction 12.9 per cent.

The stillbirth rates follow the same general order of increase in relation to the type of delivery as do the neonatal death rates. In general, except in delivery by version and extraction and by cesarean section there are about an equal number of neonatal deaths and stillbirths in each group. Associated with cesarean sections there are only half as many stillbirths (thirty-one) as there are neonatal deaths (sixty-two), owing largely to the fact that unless the mother's life is at stake sections are not performed when the fetus is dead. The stillbirths (thirty-five) are 50 per cent higher than the neonatal deaths (twenty-three) when delivery is by version and extraction.

Correction of Figures for Conditions Which Are Not Affected by Type of Delivery.—The gross figures appear to indicate that delivery by low forceps has a considerably lower rate than any other type. However, since the delivery itself can have no effect on deaths occurring before the onset of labor, on those due to major malformations or on those resulting from delivery of the fetus before the period of viability, the deletion of these from the total deaths with recalculation of the rates gives much more accurate information regarding the effect of delivery (table 1). The mortality rate (neonatal deaths and stillbirths combined) thus calculated for natural cephalic delivery (1 per cent) is only one third of its gross rate and is slightly lower than delivery by low forceps (1.1 per cent). Although the total rate in each type of delivery is lowered, in each it is lowered proportionately less than in spontaneous cephalic deliveries, so that in relation to this type of delivery other methods have a greater hazard than is indicated by the gross figures.

TABLE 1.—*Corrected Mortality Rates*

	Gross Mortality, per Cent	Corrected Mortality, per Cent*	Corrected Mortality, per Cent, Adjusted to 5 per Cent Prematurity†
Total deliveries	4.4	2.5	2.5
Natural cephalic deliveries	3.0	1.0	1.1
Low forceps	1.4	1.1	1.3
Mid and high forceps	5.0	4.2	5.0
Breech deliveries	16.5	9.7	7.1
Cesarean section	8.9	6.5	4.1
Version and extraction	34.5	22.3	13.4

* Deletion of all infants and fetuses dying before the onset of labor, before the period of viability or from malformations.

† 0.05 times the death rate for prematures in each type of delivery plus 0.95 times the death rate for term infants in each type of delivery.

Even after these calculations are made there still remain the variations in the number of premature births in each group as factors affecting the death rates. The mortality rate for premature fetuses and infants is approximately eighteen times that of those at term, so that a large number of premature infants in any one group makes the figures for that type of delivery disproportionately high. Since among the live born infants delivered in the hospital 5 per cent are premature, adjustment of the number in each type of delivery to 5 per cent eliminates prematurity as a factor causing variation in the death rates. After the previable, malformed and those dead before the onset of labor have

been eliminated and the adjustment made for prematurity, the corrected rate is slightly raised for natural cephalic (1.1 per cent), low forceps (1.3 per cent) and mid forceps (5 per cent) deliveries and lowered for breech (7.1 per cent), cesarean section (4.1 per cent) and version and extraction (13.4 per cent). Thus delivery by low forceps has a slightly higher rate than natural cephalic delivery, while mid forceps is four and one-half times as high, breech six and one-half times, cesarean section a little more than three and one-half times and version and extraction twelve times as high.

Natural Cephalic Delivery.—Of the 10,877 infants and fetuses born by natural cephalic delivery, 1.5 per cent were stillborn and 1.5 per cent died in the neonatal period. Only one third were at term (term 33 per cent, viable premature 52.4 per cent, previable 14.2 per cent). In each of the age groups there were approximately an equal number of stillbirths and neonatal deaths. Maternal complications were associated with fetal or neonatal death in 57 per cent of the stillborn and in 32 per cent of the live born infants. The most common complication was toxemia, which occurred in 27.6 per cent of the mothers of stillborn fetuses and 10 per cent of those infants who died in the neonatal period. Hemorrhage from placenta praevia or premature separation of the placenta occurred with the next greatest frequency and was associated with 15.2 per cent of the stillborn fetuses and 5.7 per cent of the live born infants who died in the neonatal period.

Investigation of the pathologic lesions at autopsy reveals the startling fact that 38.6 per cent of the live born infants and only 10.3 per cent of the stillborn fetuses died as a result of major malformations. If only infants at term are considered, 67 per cent of those live born died of malformations while 14.6 per cent of the stillborn fetuses died of the same cause. Thus in live born infants who are delivered without instrumentation the most important lethal factor is a major malformation.

In addition to malformations, the most common pathologic lesions in infants dying during the neonatal period are intracranial hemorrhage 12 per cent and anoxemia 12 per cent. Ninety-two per cent of the previable infants, 39 per cent of the premature infants and only 4 per cent of the infants at term showed no pathologic changes.

The other conditions found at autopsy in stillborn fetuses were anemia 11.2 per cent, intracranial hemorrhage 1.7 per cent, intra-uterine pneumonia 1.7 per cent and no demonstrable pathologic changes 73.4 per cent. Slightly over half (51.7 per cent) of the fetuses examined at autopsy were macerated.

The majority (85 per cent) of the fetuses born of mothers with no known complications were macerated; they were macerated in slightly less than half of those in which there was an associated toxemia (42.4 per cent) and in only 29 per cent of those associated with placenta praevia or abruptio placentae. This indicates that intra-uterine deaths associated with no known maternal complications usually take place hours or days before delivery; those associated with toxemia occur before the onset of labor and during labor with about equal frequency, while the greatest number of deaths associated with maternal hemorrhage occur only a short time before delivery.

Cephalic Delivery Aided by Forceps.—Among the 3,995 deliveries in which low forceps were used there were 0.55 per cent stillbirths and 0.87 per cent live born infants who died during the neonatal period. Maternal complications were present in association with 52 per cent of the deaths in this group in contrast to 44 per cent in natural cephalic deliveries. Seventy per cent were at term. Causes of death in the thirty-two infants and fetuses examined at autopsy were intracranial hemorrhage 31 per cent, anoxemia 28 per cent, malformations 25 per cent and no abnormalities 16 per cent.

A total of 835 infants and fetuses were delivered by mid or high forceps. Of these 2.6 per cent were stillborn and 2.4 per cent died in the neonatal period. In 45 per cent Duehrssen's incisions were made prior to delivery. There were, in the total group, nine mothers showing toxemia and two with abruptio placentae, and in most of the remainder there was difficulty in delivery, the latter due especially to cervical dystocia. Seventeen per cent of the infants and fetuses were premature, 83 per cent were at term. Thirty-two were examined at autopsy. Sixty-five per cent of these showed evidence of birth trauma, 9 per cent died of major malformations, 13 per cent died of anoxemia and 13 per cent showed no pathologic lesions.

In both groups of infants and fetuses examined at autopsy the main cause of death was birth trauma; it accounted for death in 65 per cent of those delivered by mid forceps, 31 per cent of those delivered by low forceps.

Breech Delivery.—A total of 708 infants and fetuses were delivered in a breech position with a resulting mortality of 7.9 per cent during the neonatal period and an incidence of 8.6 per cent stillbirths.

The causes of death demonstrable at autopsy in infants and fetuses delivered in a breech position were anoxemia 20 per cent, intracranial or intraperitoneal hemorrhage 17.4 per cent, malformations 10.6 per cent and infections 4 per cent. In 48 per cent no anatomic cause of death could be demonstrated; this includes the 20 per cent that were macerated, the 17 per cent that were previable and the 11 per cent that were premature or at term that showed neither maceration nor pathologic lesions. Maternal complications were present before delivery in 32.6 per cent of the women whose infants died or were stillborn; toxemia occurred in 12 per cent, hemorrhage due either to placenta praevia or to premature separation of the placenta in 12 per cent and prolapse of the cord in 10.6 per cent.

Delivery by Cesarean Section.—Among 1,041 cesarean sections there were delivered thirty-one (3 per cent) stillborn fetuses and sixty-two (6 per cent) live born infants who died during the neonatal period. Of the total number of infants and fetuses 36.5 per cent were at term, 50.5 per cent were premature but viable and 13 per cent were previable.

The main indication for cesarean section in the cases in which the fetuses were stillborn was hemorrhage due to premature placental detachment; this was present twenty-two (70 per cent) times; seven of these were associated with toxemia. In six (20 per cent) the indication for section was severe toxemia without premature placental separation, in two (7 per cent) central placenta praevia, in one (3 per cent) brain tumor. Twenty-two of the fetuses were examined at autopsy. Fifty-five per cent showed the petechial hemorrhages characteristic of interference with circulation, and in 9 per cent there was intracranial hemorrhage. In 36 per cent there were no pathologic lesions; of these, 23 per cent were so macerated that petechial hemorrhages could not have been identified even if originally present.

The indications for cesarean section in the sixty-two live born infants who subsequently died were toxemia 35.4 per cent, hemorrhage 30.6 per cent (placenta praevia nine, abruptio placentae ten), medical complications 19.5 per cent (heart disease nine, tuberculosis one, diabetes one, epilepsy one), small pelvis 11 per cent (first section two, with previous section five), necrotic fibroid one (1.6 per cent), previous antepartum fetal death one (1.6 per cent).

Forty-four of these infants were examined at autopsy. twenty-seven per cent of these showed no pathologic lesions (six were viable premature infants, three previable infants). Twenty-one per cent (three term, six premature) had marked edema of the brain without other demonstrable abnormality, 19 per cent had petechial hemorrhages, 16 per cent showed intracranial hemorrhage (three term, four premature), 10 per cent had major malformations, 7 per cent had pneumonia. It is interesting to note that six of the seven cases showing intracranial hemorrhage were cases in which the indication for section was toxemia.

The total 1,041 cesarean sections have been analyzed according to the indications for which they were performed. In considerably over half (60.1 per cent) the indication was disproportion, dystocia or previous cesarean section. The infants were stillborn or died in the neonatal period in only 1.1 per cent of these cases. Hemorrhage from premature separation of the normally implanted placenta or placenta praevia was the indication in 12.5 per cent, with fetal or neonatal deaths occurring in 33.6 per cent. Toxemia (in most instances due to chronic renal impairment) was the indication in 12.3 per cent; the infants were stillborn or died in the neonatal period in 22.7 per cent of this group. The remaining 15.1 per cent of the sections were performed because of cardiac insufficiency or other local or systemic conditions; 10 per cent of these infants were stillborn or died in the neonatal period.

Thus, although the indication was hemorrhage or toxemia in only 25 per cent of the total cesarean sections, in 76 per cent of the sections in which the fetus or infant succumbed this was the indication present. When cesarean section is performed in the absence of maternal complications which may involve the fetus, the mortality rate is low.

Delivery by Version and Extraction.—A total of 162 infants and fetuses were delivered by version and extraction; 20.3 per cent were stillborn and 14.1 per cent died in the neonatal period. Forty-three per cent were at term, 53.5 per cent were premature but viable and 3.5 per cent were previable.

The principal indication for version and extraction which was followed by death of the fetus or infant was hemorrhage associated with placenta praevia or premature placental separation. This was present twenty-eight times, or in approximately half of the cases. Malposition (ten) or long labor (two) occurred in about one fifth of the cases, while prolapsed cord (four), failed forceps (four), hydramnios (three), toxemia (two), second twin (one) and unstated (two) made up the remainder. Toxemia was present in eight cases in addition to the two in which it is given as the indication for version (malposition two, placenta praevia one, placental separation two, failed forceps one, prolapsed cord two).

In seven cases the Braxton Hicks was the type of version performed. In fifteen (26 per cent) a bag induction preceded the version.

Thirty-seven of the total fifty-six dead infants and fetuses were examined at autopsy. The cause of death was anoxemia in 50 per cent, malformations in 19 per cent, intracranial hemorrhage in 13.5 per cent, pneumonia in 2.7 per cent and undetermined in 16 per cent.

Version and extraction carries the highest fetal and infant mortality of any operative procedure. From an analysis of the cases, however, it becomes evident that the high rate is due to the type of case in which this procedure is instituted rather than to the delivery itself. Death in the five infants showing evidence of intracranial injury may probably be attributed to the type of delivery, but the majority of the 50 per cent of deaths from anoxemia were due to maternal hemorrhage or interference with circulation through the cord. The 19 per cent due to major malformations cannot be attributed to the type of delivery.

Delivery by Craniotomy.—Among the fifty-eight infants delivered by craniotomy, thirty-four died before the onset of labor and twenty-four during labor. Twenty of the thirty-four dying before the onset of labor were macerated. There are no outstanding causes of death as shown by autopsy or maternal complications. In about one fourth there were no known maternal complications or demonstrable abnormalities in the infants or fetuses. Nine were associated with maternal toxemia, eight with placenta praevia or premature placental separation, eight were malformed infants (none of whom were born of mothers with complications), eight were associated with cord knots, prolapse, entanglements and the like. In eleven there was a history of long labor or difficult delivery, and two of these infants showed evidence of intra-uterine pneumonia. There were also no great differences in causes of antepartum and intrapartum deaths except in the number of deaths occurring without maternal complications (excluding the malformations). Of these there were eleven cases in the antepartum period and only two in the intrapartum period.

MATERNAL COMPLICATIONS

Maternal Complications in Relation to Pathologic Conditions in the Infant and Fetus.—In 44.6 per cent (354) of the 773 fatalities in this series maternal complications including premature placental separation, placenta praevia, toxemia, cord entanglements or prolapse, medical complications (heart disease, diabetes, pyelitis and the like) or syphilis were present. In only 31.6 per cent, however, could the complication be considered as the probable cause of death, for in the other 13 per cent definite pathologic lesions such as intracranial hemorrhage, malformations and infections were present. In those cases in which the only pathologic lesions demonstrable were petechial hemorrhages, death was believed probably due to the maternal complications and they are included in the 32 per cent so designated.

Hemorrhage from premature placental separation or placenta praevia was the most common complication and was found in 117 cases (33 per cent). In almost half (43 per cent) of these infants and fetuses there were no pathologic lesions. In over one third (38 per cent) petechial hemorrhages were present, and in the remaining 17 per cent a variety of causes of death were found.

Among the infants born of toxemic mothers (114) only 18 per cent showed definite evidence of anoxemia (petechial hemorrhages) and 21 per cent showed other pathologic lesions, while in 61 per cent no evidence of

a cause of death could be found. It is very probable that toxemia was the main inciting factor in the majority of the first and last groups.

In an additional twenty-eight cases both toxemia and premature placental separation were present. Seventeen of these infants and fetuses had petechial hemorrhages in the thoracic viscera; in eleven there were no abnormalities.

Cord abnormalities producing interference with circulation (fifty-four) were less than half as common as either toxemia or hemorrhage. As would be expected, the most common abnormalities in these infants were those indicative of anoxemia (42 per cent). In 13 per cent there was intracranial hemorrhage or a major malformation, and in 44 per cent no pathologic changes were present. In one third of the last group maternal hemorrhage or toxemia also was present.

Absence of Maternal Complications.—There were no maternal complications associated with the death of 419 (55 per cent) fetuses and infants. Of these, 175 (22.6 per cent of all deaths) showed pathologic changes at autopsy or a fairly definite cause of death was assigned clinically. In 244 (30.2 per cent) there was neither a maternal complication nor a demonstrable cause of death. In the different age groups, absence of maternal complications and pathologic lesions occurred with the following frequency: (*a*) deaths in the neonatal period; term, 8.2 per cent, premature, 29.1 per cent, previable, 63 per cent; (*b*) stillborn; term, 20.6 per cent, premature, 20.6 per cent, previable 47.8 per cent.

TABLE 2.—*Causes of Death Associated with Types of Delivery*

	Natural Cephalic Delivery			Low Forceps Delivery			Mid and High Forceps Delivery			Breech Delivery			Cesarean Section			Version and Extraction		
	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent	Neonatal Deaths	Stillbirths	Total, per Cent
Hemorrhage	18	4	6.4	11	3	24.5	16	13	69.1	10	8	15.0	8	2	10.8	7	..	12.5
Intracranial	17	3	....	10	3	....	14	11	....	8	7	....	8	2	....	7	..	....
Intracranial and pneumonia	..	1	....	1	..	....	..	2	....	2	..	....	..	..	....	..	..	....
Visceral	1	..	....	..	..	....	2	..	....	..	1	....	..	..	....	..	..	....
Anoxemia	18	16	9.8	4	14	31.6	..	5	11.9	7	18	20.8	12	17	31.2	2	23	44 6
Maternal complications	7	14	....	2	9	....	..	3	....	6	14	....	12	17	....	2	23	....
Abruptio or placenta praevia	2	4	....	1	2	....	..	2	....	3	5	....	7	17	....	1	11	....
Abruptio and toxemia	..	1	....	..	2	....	..	.	....	..	2	....	..	..	....	..	..	....
Toxemia	1	1	....	..	3	....	..	1	....	2	3	....	2	..	....	..	..	....
Cord complications	4	6	....	..	2	....	..	..	....	1	4	....	..	..	....	1	2	....
Medical complications	..	2	....	1	..	....	..	..	....	..	..	....	3	..	....	..	10	....
No maternal complications	11	2	....	2	5	....	..	2	....	1	4	....	..	..	....	..	..	....
Malformations	50	11	17.7	8	4	21.1	2	1	7.1	..	11	9.2	4	..	4.3	1	6	12.5
Infections	6	3	2.6	..	..	0.0	..	..	0.0	3	..	1.5	3	..	3.2	3	..	5.4
Pneumonia	3	1	....	..	..	....	..	..	....	1	..	....	3	..	....	3	..	....
Syphilis	1	2	....	..	..	....	..	..	....	1	..	....	..	..	....	..	..	....
Septicemia	1	..	....	..	..	....	..	..	....	1	..	....	..	..	....	..	..	....
Diphtheria	1	..	....	..	..	....	..	..	....	..	..	....	..	..	....	..	..	....
Idiopathic conditions	..	7	2.3	..	..	0.0	..	..	0.0	..	..	0.0	10	..	10.8	..	..	0.0
Edema of the brain	..	7	....	..	..	....	..	..	....	..	..	....	10	..	....	..	..	....
No pathologic changes	82	129	61.2	12	1	22.8	2	3	11.9	40	23	52.5	25	12	39.7	10	4	35.0
Maternal complications	19	69	....	2	..	....	2	..	....	7	15	....	25	12	....	9	4	....
Abruptio or placenta praevia	4	19	....	1	..	....	..	..	....	2	5	....	7	5	....	6	2	....
Abruptio and toxemia	1	7	....	..	..	....	..	..	....	..	1	....	..	..	....	..	..	....
Toxemia	6	32	....	1	..	....	2	..	....	2	3	....	12	6	....	1	1	....
Cord complications	..	5	....	..	..	....	..	..	....	..	5	....	..	..	....	..	..	....
Medical complications	6	3	....	..	..	....	..	..	....	1	1	....	6	1	....	2	1	....
Syphilis	2	3	....	..	..	....	..	..	....	2	..	....	..	..	....	..	..	....
No maternal complications	63	60	....	10	1	....	..	3	....	33	8	....	..	..	....	1	..	....
Total	174	170	100.0	35	22	100.0	20	22	100.0	60	60	100.0	62	31	100.0	23	33	100.0

Maternal Complications in Relation to Time of Death.—The lowest incidence of maternal complications is found in term infants who die in the neonatal period (9 per cent). In stillborn term fetuses the incidence of complications in the mother is three times as great (28 per cent). They are most common in association with the birth of dead premature or previable fetuses (37 per cent), while they occur in 26 per cent of premature or previable infants who died in the neonatal period.

There were only thirteen women in whom a history of a syphilitic infection was obtained. Only four of nine infants or fetuses examined at autopsy showed evidence of syphilis; in the three not examined there was no clinical evidence of syphilis. The total incidence of maternal syphilis in this series is only 1.3 per cent. It is probable that not more than half this number actually died of syphilis.

CAUSE OF DEATH AS DEMONSTRATED BY AUTOPSY

Incidence of Pathologic Lesions in Relation to Time of Death (table 3).—Sixty-eight per cent (526) of all dead infants and fetuses born in the Chicago Lying-in Hospital during the period under investigation were examined at autopsy; this comprised 66 per cent of the live born infants and 70 per cent of the stillborn fetuses. The number of live born (48 per cent) and the number of stillborn (52 per cent) were almost equal, and the number falling into the previable, premature and term groups were remarkably evenly divided between those stillborn and those which were live born. Of the entire group 12.2 per cent were previable, 14.1 per cent were premature and 43.7 per cent were at term.

It was impossible to demonstrate pathologic changes in 52 per cent of the stillborn fetuses and in 32 per cent of the live born infants. However, in only eleven term infants and fetuses was there absence of pathologic lesions. Only 5 per cent of live born infants in whom

no pathologic lesions were present were at term, so that in the remaining 27 per cent prematurity was the probable cause of death.

In ninety-seven of the 148 stillborn fetuses in whom no pathologic lesions were demonstrable, maceration had advanced to a degree sufficient to have masked any hemorrhage which might have been present; there were only 18 per cent of the fetuses which showed neither maceration nor pathologic changes.

In the combined series of stillbirths and neonatal deaths anoxemia (18.5 per cent) and malformations (18.1 per cent) are the most important lethal factors, and an almost equal number of deaths fall in each group. However, the distribution is decidedly different in the two groups, for there are twice as many malformations as anoxemias in the live born group and twice as many anoxemias as malformations among those who were stillborn. Thus malformations are the most common cause of death in live born infants (24.5 per cent), while anoxemia is the most common cause in stillborn fetuses (23.8 per cent). Anoxemia accounts for 12.2 per cent of the deaths in live born infants, malformations for 12.4 per cent of the deaths in stillborn fetuses.

TABLE 3.—*Causes of Death as Demonstrated at Autopsy of 526 Fetuses and Infants*

	Hemorrhage		Anoxemia		Malformations		Infections		Miscellaneous		Undetermined		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent	Number	Per Cent
Term	52	22.6	44	19.0	62	26.8	10	4.3	2	0.9	61	26.4	231	100.0
Live birth	32	31.1	9	8.7	43	41.7	6	5.8	2	2.0	11	10.7	103	100.0
Stillbirth	20	15.6	35	27.3	19	14.8	4	3.1	..	...	50	39.2	128	100.0
Premature	29	12.4	51	21.9	33	14.2	5	2.1	7	3.0	108	46.4	233	100.0
Live birth	23	20.7	20	18.0	17	15.3	4	3.6	7	6.3	40	36.1	111	100.0
Stillbirth	6	4.9	31	25.4	16	13.1	1	0.9	..	...	68	55.7	122	100.0
Previable	2	3.2	2	3.2	..	....	1	1.7	..	...	57	91.9	62	100.0
Live birth	2	6.5	1	3.2	..	....	1	3.2	..	...	27	87.1	31	100.0
Stillbirth	..	...	1	3.2	..	....	..	...	..	...	30	96.8	31	100.0
Total	83	15.8	97	18.5	95	18.1	16	2.9	9	1.7	226	43.0	526	100.0

The third most frequent cause in the combined series is gross hemorrhage, usually intracranial and usually traumatic. It is present in 15.8 per cent of the entire group but is more than twice as frequent in live born infants as in stillborn fetuses. It accounts for 23.4 per cent of the deaths in live born infants (second in importance) and for 9.3 per cent of the stillbirths (third in importance).

Infections are much less frequent than the three preceding factors and caused death in only 3 per cent of the cases. They are twice as common in live born infants as in stillborn fetuses. The types of infections were pneumonia nine (those having both intracranial hemorrhage and pneumonia were placed with the former group), syphilis four, septicemia two and diphtheria one.

The incidence of syphilis seems remarkably low, but in addition to the four cases of proved syphilis there were only five other infants examined at autopsy who had been born of mothers with a positive Wassermann reaction, and syphilis could not be demonstrated in those infants. The total of nine cases, four proved and five in which it may possibly have been a contributing factor, represents only 1.3 per cent of all the infants and fetuses examined at autopsy.

Edema of the brain without other pathologic changes was present in 1.7 per cent of all autopsies but was found only in live born infants. Its significance is not definitely known, and whether or not it is a lethal factor cannot be stated positively. It was found most frequently following birth by cesarean section; the majority of the infants lived from eight to twenty-four hours and showed clinical evidence of increased intracranial pressure.

Erythroblastosis was present in four live born infants and in six stillborn fetuses, an incidence of 1.3 per cent of the total deaths. These cases were included with those presenting malformations because the conditions seem most probably due to a congenital malformation of blood-forming tissue.

Only one case of hemorrhagic disease of the newborn was present in the entire series. This case was included under visceral hemorrhage.

Pathologic Changes in Relation to Type of Delivery.—In autopsies performed on viable infants and fetuses malformations account for 5 per cent of the deaths of those delivered by cesarean section, 7 per cent of those by high or mid forceps, 9.2 per cent of those by version and extraction, 9.3 per cent of those by breech delivery, 14 per cent of those by low forceps and 20 per cent by natural cephalic delivery. It is interesting to note that this is almost the reverse order of importance of intracranial hemorrhage as a cause of death.

Anoxemia accounts for 8.1 per cent of the cases in which autopsies were performed on viable infants and fetuses delivered naturally in a cephalic position, 9.3 per cent by high or mid forceps, 15.7 per cent by low forceps, 17.6 per cent by breech, 23.4 per cent by cesarean section and 33.4 per cent by version and extraction.

Intracranial hemorrhage accounts for 6.1 per cent of the deaths among autopsies performed on viable infants and fetuses delivered naturally in a cephalic position, 9.2 per cent by version and extraction, 9.6 per cent by cesarean section, 17.5 per cent by low forceps, 21.1 per cent by breech deliveries and 46.8 per cent by high or mid forceps.

Of the three most important causes of death, anoxemia shows the highest incidence in version and extraction and in cesarean section; malformations in natural cephalic deliveries and in those aided by low forceps; intracranial hemorrhage in high forceps and in breech deliveries.

Pathologic Lesions in Relation to Degree of Maturity.—Anoxemia occurs as a cause of death with fairly equal frequency in the total number of autopsies on infants and fetuses at term (19 per cent) and those in the premature period (21.9 per cent). Malformations are almost twice as frequent a cause of death in those at term (26.8 per cent) as in those who succumb in the

premature period (14.2 per cent). Contrary to the commonly stated fact that death in the premature infant is much more likely to be due to intracranial hemorrhage than it is in an infant at term, the opposite is shown to be true by this series of autopsies. Only 12.4 per cent of all the premature infants who were examined at autopsy showed intracranial hemorrhage, while it was present in 22.6 per cent of the term infants who were examined at autopsy. Of 100 premature infants and fetuses and 100 at term, intracranial hemorrhage is found at autopsy only half as frequently in the premature as in the ones at term. However, since neonatal deaths and stillbirths are approximately eighteen times as common in premature infants as in those at term, it may be said that any premature infant alive at the onset of labor and about to be delivered has twenty-one times as many chances of dying from anoxemia, ten times as many chances of dying of a malformation and eleven times as many chances of dying from intracranial hemorrhage as does an infant at term.

No pathologic lesions were demonstrable in 46.4 per cent of the premature fetuses and infants and in 26.4 per cent of the fetuses and infants at term.

Death in an infant or fetus at term is more commonly due to malformation than any other demonstrable cause; death in the premature period is more commonly due to anoxemia than to any other demonstrable cause.

SUMMARY

Although only 6.3 per cent of all infants and fetuses delivered at the Chicago Lying-in Hospital from May 1931 to Jan. 1, 1938, had not reached term before delivery, this group accounted for 59 per cent of the total mortality. In only 57 per cent of all dead infants and fetuses examined at autopsy could a definite pathologic state be demonstrated. This varied from 90 per cent for live born term infants to 44 per cent for premature stillborn infants. In live born infants who died in the neonatal period the most important causes of death were malformations (24.5 per cent), intracranial hemorrhage (23.4 per cent) and anoxemia (12.2 per cent), while in stillborn fetuses the most important causes were anoxemia (23.8 per cent), malformations (12.4 per cent) and intracranial hemorrhage (9.3 per cent). Malformations accounted for a remarkably high proportion of deaths in full term infants who died in the neonatal period (41.7 per cent of those examined at autopsy).

Complications, exclusive of those due to the mechanism of labor, occurred during pregnancy or labor in association with 45.7 per cent of all fetal or neonatal deaths. The most important were toxemia and hemorrhage from premature separation of the placenta or placenta praevia. These were found in association with 33 per cent of the total deaths. Abnormalities of the cord (7.0 per cent), syphilis (1.6 per cent) and other pathologic conditions (3.4 per cent) made up the remaining 12 per cent.

The gross mortality rate does not give an accurate estimate of the role which various types of delivery may play in contributing to fetal and neonatal deaths. A disproportionately large number of premature infants and fetuses delivered by a certain method means a disproportionately high death rate in that group. Eliminating those infants and fetuses that died before the onset of labor, that had not reached the period of viability or in which death was the result of a major malformation gives mortality rates corrected in such a way that some estimate may be made of the effect of various types of delivery. The total mortality (both stillbirths and neonatal deaths) corrected on this basis is 2.5 per cent. If these figures are adjusted so that they represent the total mortality had there been 5 per cent premature infants delivered by each method (the incidence of viable premature infants among all live born infants was 5 per cent) the figures are natural cephalic delivery 1.1 per cent, low forceps 1.3 per cent, mid and high forceps 5 per cent, breech presentation 7.1 per cent, cesarean section 4.1 per cent, version and extraction 13.4 per cent. The total uncorrected mortality is 4.4 per cent.

STUDIES ON THE CIRCULATION IN PREGNANCY

X. SUMMARY OF STUDIES OF THE PHYSIOLOGY OF THE CIRCULATION OF NORMAL PREGNANT WOMEN: A NEW CONCEPT OF THE NATURE OF THE CIRCULATORY BURDEN OF PREGNANCY AND ITS APPLICATION TO THE MANAGEMENT OF CLINICAL PROBLEMS OF PREGNANCY

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Studies were conducted for several years (1932-1937) at the cardiac research laboratory of the Boston Lying-in Hospital on the physiology of the circulation of pregnant women.[1] The purposes of these studies were, first, to learn the dynamics of the circulation of the normal pregnant woman, second, to learn what the nature of the "increased burden" on the pregnant woman with heart disease is, and, finally, to develop, if possible, concepts which might be of clinical use in the management of normal pregnant women and pregnant women with heart disease. A summary of the results of these studies, plus pertinent studies from the literature, will be presented here.

CLINICAL AND LABORATORY EXAMINATIONS

Before proceeding to the physiologic results of this study, it seems useful to present facts bearing on the simpler clinical aspects of the subject gained from the clinical examination of the cardiorespiratory system. This study included single examinations of 3,000 normal pregnant women by us and serial examinations, i. e. monthly examinations of the same patient, of sixty-six more normal pregnant women and of 300 pregnant women with "organic" heart disease. These facts gain importance because knowledge of the normal symptoms of pregnancy may prevent erroneous diagnoses of heart

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disease in the pregnant woman. They are summarized in the accompanying table. It should be emphasized that normal pregnant women commonly complain of dyspnea. Many of them are orthopneic, that is they breathe more comfortably when they are propped up in bed. Many of them are awakened at night by attacks of palpitations and choking. Complaint of palpitations is common, as is complaint of swelling of the legs and hands. It can be seen thus that symptoms ordinarily attributed to heart disease and heart failure occur normally in the pregnant woman. Obviously such symptoms are also present in pregnant women with heart disease, but by themselves they do not indicate heart disease or congestive failure.

Physical examination during the latter part of pregnancy shows the skin flushed, moderate collapsing pulse and in many instances capillary pulsation over the fingers and the veins dilated over the abdomen and chest. Location of the apex of the heart is difficult because of the large breasts; the pulse is usually rapid and auscultation reveals usually a loud first sound at the mitral area, pulmonic and apical systolic murmurs and the pulmonic second sound commonly louder than the aortic second sound. Pulmonic systolic murmur is demonstrable in late pregnancy by careful physical examination of the heart in 100 per cent of cases and apical systolic murmur in approximately 50 per cent. The signs are those of hyperactive or hyperkinetic heart.[2] Though superficial examination might lead to an erroneous diagnosis of mitral stenosis, more careful examination, with particular note of the absence of diastolic murmur, will lead to the correct conclusion. "Functional" diastolic murmurs are not heard and do not occur because of pregnancy. Swelling of the legs is common. Transient rales almost never occur at the bases of the lungs of the normal pregnant woman. Constant rales at the bases, which never occur in normal pregnant women, are pathologic, and in a pregnant woman with heart disease constitute the most valuable sign of failure. Further discussion of the diagnosis of heart failure in pregnancy is presented elsewhere.[3]

Laboratory studies also show changes during normal pregnancy. Seven foot roentgenograms of the heart sometimes suggest slight enlargement, i. e. the transverse diameter of the heart shadow may exceed by 1 or 2 cm. half the transverse diameter of the chest. There is no crucial evidence to determine whether this is due to displacement or enlargement (hypertrophy or dilatation) of the heart or both. The lungs in roentgenograms show increased markings that could be mistaken for mild congestive failure by one not familiar with x-ray studies of pregnant women. These pulmonary x-ray changes are probably related to an increase in the vascular bed of the lungs and to perivascular infiltration.[4] The electrocardiogram is not remarkable except that a tendency toward left axis deviation as pregnancy progresses has been shown, with a shift back toward normal in the final weeks.[5] The Q wave in lead 3 is deep in 5 per cent of cases,[6] and in the chest lead,[7] with the exploring electrode placed in the fourth interspace 5 cm. to the left of the midsternal line, the T wave may become upright [8] (old technic) for 8 per cent of normal pregnant women and become inverted (old technic) again after delivery. Changes therefore which are sometimes interpreted as being related to coronary artery disease can be seen to occur during normal pregnancy. The white blood cell count [9] in pregnancy may be elevated, that is to from 12,000 to 15,000, and the sedimentation rate of the red blood cells is much increased.[10] It can be seen that use of the white cell count and sedimentation rate as indicators of rheumatic activity in pregnancy without proper corrections might lead to error. Clearcut active rheumatic fever in pregnancy, as a matter of fact, was not seen in this study (300 cases of rheumatic heart disease) and is extremely rare. It should be pointed out that "heart disease" in pregnancy means rheumatic heart disease, for practical purposes, as 91.9 per cent of 850 cardiac patients in this clinic had rheumatic heart disease.

Common Clinical and Laboratory Observations in Normal Pregnancy

I. *Symptoms*
1. Dyspnea
2. Orthopnea
3. "Pseudoparoxysmal nocturnal dyspnea"
4. Palpitations
5. Swelling of legs

II. *Signs*
1. Percussion for cardiac size unreliable
2. Apex beat obscure
3. Loud mitral first sound
4. Apical systolic murmur
5. Loud third heart sound
6. Pulmonic second sound greater than aortic second sound
7. Pulmonic systolic murmur (100 per cent)
8. Tachycardia
9. Extrasystoles
10. Prominent veins
11. Quick pulse (like Corrigan's pulse) and capillary pulse
12. Edema of lower extremities

III. *Laboratory Data*
1. Roentgenogram
   A. Slight enlargement of cardiac shadow
   B. Picture suggests pulmonary congestion
2. Electrocardiogram
   A. Deep Q-3 (5 per cent)
   B. Upright T-4 (old terminology; 8 per cent)
   C. Extrasystoles
3. Sedimentation rate increased
4. White blood cell count increased
5. Red blood cell count, Hemoglobin concentration, Hematocrit reading } decreased

In summary, then, it may be said that in the clinical examination of the pregnant woman, including the clinical laboratory tests, there are signs and symptoms which, unless properly interpreted, might lead to erroneous diagnoses of heart disease, heart failure or rheumatic activity (as shown in the table).

PHYSIOLOGIC STUDIES

The basal pulse rate is accelerated early in pregnancy and averaged, in a group of fifty-one normal pregnant women, 81 beats a minute throughout pregnancy, with

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6. Carr, F. B.; Hamilton, B. E., and Palmer, R. S.: The Significance of Large Q in Lead III of the Electrocardiogram During Pregnancy, Am. Heart J. **8**: 519 (April) 1933.
7. Thomson, K. J.; Cohen, M. E., and Hamilton, B. E.: Studies on the Circulation in Pregnancy: V. Lead 5 of the Electrocardiogram in Pregnancy, Am. J. M. Sc. **196**: 819 (Dec.) 1938.
8. At the time this work [7] was done, the accepted technic (old) of connecting the electrodes for chest leads of electrocardiograms resulted in a tracing in which the T wave was usually inverted. Subsequent to this study the technic was modified so that the T wave appears upright commonly. Chest leads taken with the modified (new) technic would show the reverse of our results, i. e. an upright T wave would be usual and an inverted one unusual.
9. Baer, J. L.: The Leukocytes in Pregnancy, Labor and the Puerperium, Surg., Gynec. & Obst. **23**: 567 (Nov.) 1916.
10. Griffin, R. J.: The Sedimentation Rate and Schilling Index in Pregnancy, Am. J. Obst. & Gynec. **28**: 532 (Oct.) 1934.

some persons showing a tendency toward gradual increase until term. Post partum the average basal pulse rate dropped to 70 beats a minute.[11] The exact time of return of the pulse rate to normal is unknown as yet.

The basal arterial blood pressure remains within normal limits (the systolic pressure less than 140 mm. of mercury and the diastolic less than 90 mm.) during the course of uncomplicated pregnancy. There seems to be a definite tendency for both average systolic and average diastolic pressure to decrease from the fourth to the ninth lunar[12] month and to increase during the tenth. The diastolic pressure shows a greater decrease, so that there is an increase in pulse pressure. This has been found by other observers[13] and may be associated with the collapsing pulse and the capillary pulse previously described.

The venous pressure in the arms was measured for twenty normal pregnant women (ninety-four observations) and for twenty-seven pregnant women with compensated cardiac disease (144 observations) by the direct method of Moritz and von Tabora[14] and was found to be within normal limits. There was a tendency to diminution during pregnancy and to slight increase post partum, but this was not marked.[15] Elevation of venous pressure measured in the femoral vein in pregnancy has been reported.[16]

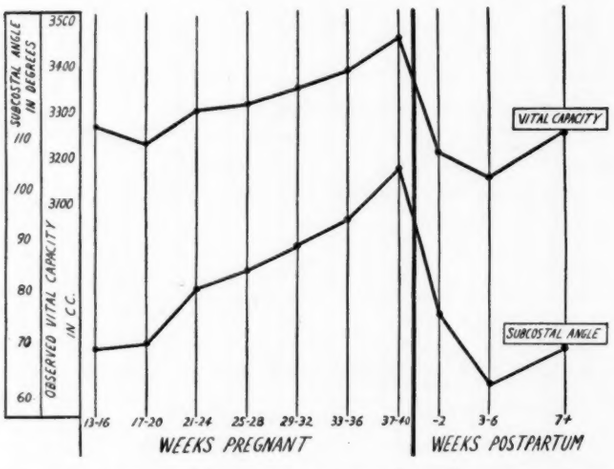

Chart 1.—The relation between the average observed vital capacity and the average curve of values for the subcostal angle in pregnancy. The heavy perpendicular line represents delivery and separates the antepartum and the postpartum period. Note the close correspondence between the two curves, indicating that changes in vital capacity correlate with changes in size and shape of the chest.

Studies of the respiratory system show a marked increase in total ventilation,[17] accompanied with slight but not proportionate increase in oxygen consumption.[18] The average vital capacity, studied in thirty-one normal pregnant women, showed a gradual rise[19] during pregnancy, with a drop post partum. It is of interest that this correlates precisely with the increase in the subcostal angle (chart 1), indicating that the explanation of this slight increase in vital capacity is increase in the size of the chest. Change in size of the chest has been shown further by x-ray studies on measurements of the thoracic cage in this clinic[19] and by studies in the literature.[20] It is commonly believed that the dyspnea of pregnancy is due to the decrease in vital capacity; however, since the vital capacity does not decrease but actually increases, the cause of the dyspnea must be sought elsewhere. The increase in total ventilation without a proportionate increase in the vital capacity is thought to be an adequate explanation for this phenomenon, as it is known that an increase in total ventilation, a decrease in vital capacity or an increase of their normal ratio may cause dyspnea.[2]

It is of note that patients with heart disease showed the same general trend in vital capacity as normal patients, that is, a slight rise during pregnancy and a fall post partum, although the average values were slightly below those of the normal pregnant woman. No patients without heart failure showed a decrease in vital capacity of 8 per cent or more. Hence, a significant drop (15 per cent) in vital capacity in a pregnant woman with cardiac disease indicated impending heart failure and was a practical early sign of failure, preceding the appearance of rales at the bases of the lungs. This point may be illustrated here by one typical case (chart 2). In these patients, as well as in those with cardiac disease whose vital capacity was studied for the first time during heart failure, a return of compensation was accompanied with a significant rise in vital capacity.[8]

Studies were made on the velocity of blood flow by the cyanide method of Robb and Weiss,[21] which utilizes the pathway between a vein and the carotid sinus. One hundred and forty-three observations of the arm-to-carotid circulation time[11] were made on thirty-six normal pregnant women, and the results fell almost without exception in the range for normal nonpregnant women. However, the average velocity of blood flow was normal early in pregnancy, increased at about the seventeenth week of gestation and decreased at the thirty-sixth week, just prior to term. The velocity of blood flow increased immediately post partum and returned to the normal level by the seventh week post partum. This general trend was present in both the peripheral and the pulmonary circulation (112 observations), being more marked in the peripheral circulation and slight in the pulmonary.

Further evidence for speeding of the circulation during pregnancy has been given by simultaneous studies of cardiac output and oxygen consumption.[22] The cardiac output rose out of all proportion to the oxygen

11. Cohen, M. E., and Thomson, K. J.: Studies on the Circulation in Pregnancy: I. The Velocity of Blood Flow and Related Aspects of the Circulation in Normal Pregnant Women, J. Clin. Investigation **15**: 607 (Nov.) 1936.

12. In this discussion the term month always refers to lunar month.

13. Henry, J. S.: Effect of Pregnancy upon Blood Pressure, J. Obst. & Gynec. Brit. Emp. **43**: 908 (Oct.) 1936.

14. Moritz, F., and von Tabora, D.: Ueber eine Methode, beim Menschen den Druck in oberflachlichen Venen exakt zu bestimmen, Deutsches Arch. f. klin. Med. **98**: 475, 1910.

15. Thomson, K. J.; Reid, D., and Cohen, M. E.: Studies on the Circulation in Pregnancy: IV. Venous Pressure Observations in Normal Pregnant Women, Pregnant Women with Compensated Cardiac Disease, Decompensated Cardiac Disease and the "Toxemias" of Pregnancy, to be published.

16. Burwell, C. S.: A Comparison of the Pressures in Arm Veins and Femoral Veins with Special Reference to Changes During Pregnancy, Tr. A. Am. Physicians **52**: 289, 1937.

17. Anthony, A. J., and Hansen, Rolf: Lungenventilation und Atmung in der Schwangerschaft, Ztschr. f. Geburtsh. u. Gynäk. **105**: 183 (May) 1933.

18. Root, H. F., and Root, H. K.: The Basal Metabolism During Pregnancy and the Puerperium, Arch. Int. Med. **32**: 411 (Sept.) 1923.

19. Thomson, K. J., and Cohen, M. E.: Studies on the Circulation in Pregnancy: II. Vital Capacity Observations in Normal Pregnant Women, Surg., Gynec., & Obst. **66**: 591 (March) 1938.

20. Zhurakovski, M. K.: The Changes in Form of the Pulmonic Cell (Thoracic Cage), the Power of Inspiration and Expiration, and the Vital Capacity of the Lungs in Pregnant and Lying-in Women, St. Petersburg, B. M. Wolf, 1893. Mackenzie, James: Heart Disease and Pregnancy, New York, Oxford University Press, 1921. Klaften, E., and Palugyay, J.: Vergleichende Untersuchungen über Lage und Ausdehnung von Herz und Lunge in der Schwangerschaft und im Wochenbett, Arch. f. Gynäk. **131**: 347, 1927.

21. Robb, G. P., and Weiss, Soma: A Method for the Measurement of the Velocity of the Pulmonary and Peripheral Venous Blood Flow in Man, Am. Heart J. **8**: 650 (June) 1933.

22. Burwell, C. S., and Strayhorn, W. D.: Observations on the Circulation During and After Pregnancy, J. Clin. Investigation **12**: 977 (Sept.) 1933.

consumption, which of course implies speeding of the circulation, as does demonstration of a decreased arteriovenous oxygen difference during pregnancy. The slowing of the circulation in the latter part of pregnancy, as demonstrated in our studies, is further corroborated by the waning of the disproportion between cardiac output and oxygen consumption during the last months of pregnancy and as the cardiac output decreases.

The cardiac output during pregnancy, according to other studies,[23] shows a gradual increase during early pregnancy, with the maximum cardiac output appearing from the sixth through the ninth lunar month. A definite decrease in cardiac output, which may even bring the value back to its normal level, occurs during the tenth lunar month. In most cases, however, the normal level is attained within several weeks after delivery.

Not only does the cardiac output during rest show an increase during pregnancy, but in addition the increase in cardiac output with exercise is disproportionately greater in pregnant women than in normal nonpregnant ones.[24]

It will be seen then that the circulation of the blood speeds up from week to week of pregnancy and slows up as the puerperium approaches. It can be seen further that corresponding with this the heart pumps more blood a minute during the same period when the blood is flowing faster. Also at the time that the circulation slows, that is, during the last four to six weeks of pregnancy, the heart pumps less blood a minute.

Studies were made of the total amount of blood in the body and its composition. Studies of total blood volume during pregnancy have been at variance but usually reported an increase.[25] One hundred observations on blood volume in pregnancy, made at this clinic [26] by the colorimetric method of Keith, Rowntree and Geraghty,[27] showed a higher value than that of the nonpregnant state, which merely corroborated the data of most previous observers. However, it was felt that the technical errors incident to this method made it valueless for the study of the exact changes from month to month for pregnant women and that such a study must await the development of a more precise method for blood volume determination. The spectrophotometric method of Gibson and Evans [28] provided the needed precision, and by this method it was possible to discover for the first time, with fourteen women on whom fifty-six determinations (forty ante and sixteen post partum) were made at intervals during pregnancy, the exact trend of the change in blood volume. It was found that there was a progressive increase in plasma volume from early pregnancy through the ninth lunar month, when a maximum was reached, and then a decrease in the tenth lunar month. This decrease continued post partum, so that by the end of the second week the volume had reached the normal level for nonpregnant women. At the period of maximum increase the average increase is 65 per cent above the average value for normal nonpregnant women. The total cell volume, measured by the the hematocrit, also changed during pregnancy, following the trend of the plasma volume. The total blood volume increased to a maximum of 45 per cent over the value for normal nonpregnant women at the height of increase. The cause of increase in plasma volume is not known, but since the outstanding conditions in which blood volume is profoundly disturbed, such as exophthalmic goiter, myxedema and Addison's disease,[29] are due to endocrine disturbances, it is thought that the endocrine disturbance in pregnancy offers the most reasonable point for study. Moreover, there is a striking but not exact resemblance of the trend of plasma volume to that of excretion of gonadotropic substance in normal pregnancy.[30] The demonstration of the sodium and water

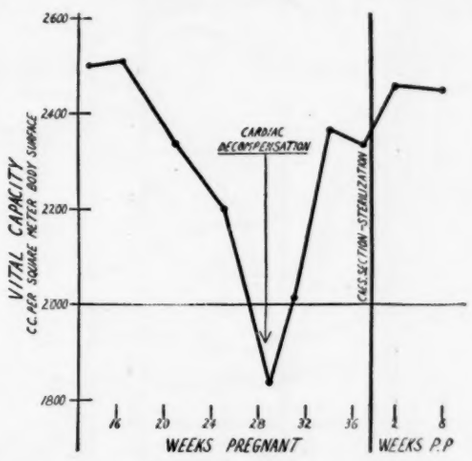

Chart 2.—The vital capacity before, during and after heart failure in a pregnant woman suffering from severe rheumatic heart disease. Note the steady decrease in vital capacity which preceded the appearance of clinical cardiac decompensation, i. e., weakness, cough and rales at the bases of the lungs. Compensation was restored with bed rest, restriction of fluids and administration of digitalis; this was accompanied with a rise in the vital capacity. The decrease in vital capacity is a warning of impending clinical heart failure.

retaining effect of the estrogenic and androgenic substances [31] lends further support to the speculation that the increase in blood volume in pregnancy may be endocrine determined. The increased blood volume may well cause the increased cardiac output. It has been shown experimentally that increased blood volume leads to increased cardiac output; [32] how far the results of studies in which blood volume is raised acutely apply to pregnancy, in which blood volume is increased over a long period, is not known.

Studies of the red blood cell count and hemoglobin and hematocrit readings showed changes which correlated inversely with the change in plasma volume, that is, as the plasma volume increased, the red blood cell count, hematocrit reading and hemoglobin per unit volume of blood decreased. These studies showed return toward normal before delivery and not post

23. Gammeltoft, S. A.: The Heart in Pregnancy, Surg., Gynec. & Obst. **46**: 382 (March) 1928. Burwell and Strayhorn.[22]

24. Schmidt, R. H.: Ueber die Herzarbeit in der Frühschwangerschaft in der Ruhe und nach Arbeitsversuchen, Monatschr. f. Geburtsh. u. Gynäk. **90**: 83 (Jan.) 1932.

25. (*a*) Rowntree, L. G.; Brown, G. E., and Roth, G. M.: The Volume of the Blood in Health and Disease, Philadelphia, W. B. Saunders Company, 1929. (*b*) Dieckmann, W. J., and Wegner, C. R.: The Blood in Normal Pregnancy: I. Blood and Plasma Volumes, Arch. Int. Med. **53**: 71 (Jan.) 1934.

26. Cohen, M. E.: Unpublished data.

27. Keith, N. M.; Rowntree, L. G., and Geraghty, J. T.: A Method for the Determination of Plasma and Blood Volume, Arch. Int. Med. **16**: 547 (Oct.) 1915.

28. Gibson, J. G., 2d, and Evans, W. A., Jr.: Clinical Studies of the Blood Volume: I. Clinical Application of a Method Employing the Azo Dye "Evans Blue" and the Spectrophotometer, J. Clin. Investigation **16**: 301 (May) 1937.

29. Thompson, W. O.: Studies in Blood Volume: I. The Blood Volume in Myxedema, with a Comparison of Plasma Volume Changes in Myxedema and Cardiac Edema, J. Clin. Investigation **2**: 477 (Aug.) 1926. Rowntree, Brown and Roth.[25]

30. Browne, J. S. L.; Henry, J. S., and Vennery, E. H.: The Urinary Excretion of Prolan, Oestrin and Pregnandiol in Normal Pregnancy and in Early and Late Pregnancy Toxemias, to be published.

31. Thorn, G. W., and Harrop, G. A.: The "Sodium Retaining Effect" of the Sex Hormones, Science **86**: 40 (July 9) 1937.

32. Altschule, M. D., and Gilligan, D. R.: The Effects on the Cardiovascular System of Fluids Administered Intravenously in Man: II. The Dynamics of the Circulation, to be published.

partum and supplemented the original observations of Kühnel.[33] The mean corpuscular volume of the red cells was relatively high during pregnancy, reaching an average maximum of 90.9 cubic microns (twelve cases). It can be seen therefore that the increase in plasma volume accounts in part at least, as has been stated before,[34] for the so-called physiologic anemia of pregnancy.

No severe anemia developed in the patients studied throughout pregnancy, and one might add the general clinical statement that in the absence of infection, such as pyelitis, or of inadequate diet, no severe anemia was noted at this hospital in patients known to have normal blood before the onset of pregnancy. In other words,

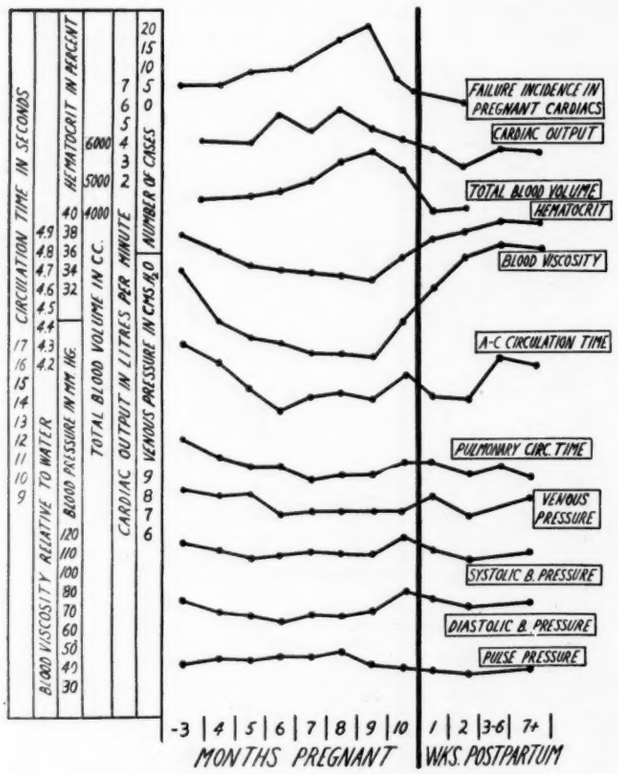
CIRCULATION TIME IN SECONDS
BLOOD VISCOSITY RELATIVE TO WATER
HEMATOCRIT IN PERCENT
BLOOD PRESSURE IN MM. HG.
TOTAL BLOOD VOLUME IN CC.
CARDIAC OUTPUT IN LITRES PER MINUTE
VENOUS PRESSURE IN CMS. H2O
NUMBER OF CASES
FAILURE INCIDENCE IN PREGNANT CARDIACS
CARDIAC OUTPUT
TOTAL BLOOD VOLUME
HEMATOCRIT
BLOOD VISCOSITY
A-C CIRCULATION TIME
PULMONARY CIRC. TIME
VENOUS PRESSURE
SYSTOLIC B. PRESSURE
DIASTOLIC B. PRESSURE
PULSE PRESSURE
-3 | 4 | 5 | 6 | 7 | 8 | 9 | 10
MONTHS PREGNANT
1 | 2 | 3-6 | 7+
WKS. POSTPARTUM

Chart 3.—A summary of the studies of the circulation in pregnancy. The heavy perpendicular line represents delivery and separates the antepartum and the postpartum period. The data on cardiac output are taken from Burwell[22] and the others from our work. The total blood volume and cardiac output have similar trends, i. e., increase during the early part of pregnancy and decrease in the last months. The viscosity of the blood and the hematocrit reading, which correlate fairly well with the hemoglobin concentration of the blood, show decrease during early pregnancy and increase during the last months. The curve for circulation time parallels somewhat that of the blood viscosity, that is the blood flows faster when thinner. It also suggests that the blood flow is most rapid at the time of the greatest blood volume and cardiac output, with coincident return toward normal with these two functions. The venous pressure remains within normal limits and is constant for the last five months of pregnancy, with a slight postpartum rise. Both the systolic and the diastolic arterial blood pressure showed a slight rise in the last month of pregnancy, although the patients were normal and not "toxemic." It should be emphasized that after the eighth month, when there is maximum incidence of heart failure, there is return toward normal of values for blood volume, blood flow (circulation time, cardiac output) and blood content (hematocrit reading, viscosity). The incidence of heart failure decreases, corresponding with, this return to normal of the circulatory functions.

our experience has been that normal pregnancy may accentuate anemia but not alone cause severe anemia.

Calculations of the viscosity of the blood during pregnancy, from studies of thirty-six women, show that it decreases, reaching a minimum during the ninth lunar month, commences to return toward normal, that is, becomes more viscid, in the tenth lunar month and reaches normal in the puerperium.[11]

It will be noted (chart 3) that the viscosity varies with the circulation time, that is, the thinner the blood, the faster it flows during pregnancy. This follows a well known physical law (Poiseuille's) which states that the less viscous the liquid, the more rapid its flow, all other factors being equal. Actually this may operate through increased cardiac output.

No adequate studies have been made of the veins, arteries and capillaries during pregnancy. Infra-red photographic studies[35] of the superficial veins of the normal pregnant woman have been made at this clinic. These showed clearly marked venous dilatation over the breasts and abdomen, with disappearance of the dilatation over the abdomen after delivery but persistence of the changes over the breasts until lactation ceased.

The placental circulation is of interest, as it is composed[36] of arteries connecting with veins through large vascular spaces without the interposition of other capillaries. This arrangement in the maternal portion of the placenta presents certain similarities to an arteriovenous fistula. This arrangement of the placental circulation has been suggested by Burwell[37] in an interesting presentation as an important factor in causing changes in the circulation during pregnancy. However, it does not appear to explain completely all the observed changes and as yet has not been demonstrated to be consistent with the fact of return toward normal before delivery of some of the circulatory functions.

A summary of the actual physiologic changes, as pictured in chart 3, gives a fairly clear idea as to some aspects of the increased burden on the heart in pregnancy. As pregnancy progresses the blood volume, the cardiac output and the velocity of blood flow increase. These increases commence early in pregnancy and progress steadily during pregnancy, reaching a maximum during the ninth lunar month. In the last month a return toward normal begins, with a consequent lightening of the burden on the heart.[37a] In other words, contrary to popular belief, the return toward normal does not begin at delivery but at a period preceding it. Further evidence supporting this concept comes from electrocardiographic studies[5] from this clinic, in which, as mentioned before, it was demonstrated that the left axis deviation of pregnancy begins to diminish not post partum but in the final weeks of pregnancy; x-ray studies of heart volume[38] also revealed a tendency to decrease toward normal not post partum but in the final weeks. If this concept of the circulatory burden is correct, how does it correlate with clinical experience?

If one examines the curve of onset of heart failure in pregnant women[39] with heart disease at this clinic,[40]

33. Kühnel, P.: Untersuchungen über die physiologische Schwangerschaftsanämie, Ztschr. f. Geburtsh. u. Gynäk. **90:** 511, 1927.

34. Yang, C. S., and Keefer, C. S.: The Anemias of Pregnancy, Nat. M. J., China **16:** 159 (April-June) 1930.

35. Hersheimer, A.: Unpublished data.

36. Spanner, Rudolf: Mütterlicher und kindlicher Kreislauf der menschlichen Placenta und seine Strombahnen, Ztschr. f. Anat. u. Entwcklngsgesch. **105:** 163 (Nov.) 1935.

37. Burwell, C. S.: The Placenta as a Modified Arteriovenous Fistula, Considered in Relation to the Circulatory Adjustments to Pregnancy, Am. J. M. Sc. **195:** 1 (Jan.) 1938.

37a. The concepts here expressed were first presented by the authors at meetings of the New England Heart Association and appeared in abstract form in the New England Journal of Medicine **214:** 905, 1936, and **216:** 811, 1937.

38. Binhold, Horst: Das Herzvolumen in der Schwangerschaft, Arch. f. Gynäk. **154:** 251 (Sept.) 1933.

39. All are treated with a uniform regimen which features rest and restriction of activity.

40. Carr, F. B., and Hamilton, B. E.: Five Hundred Women with Serious Heart Diseases Followed Through Pregnancy and Delivery, Am. J. Obst. & Gynec. **26:** 824 (Dec.) 1933.

one observes that the highest incidence of heart failure is at the time when physiologically the burden on the heart is greatest. As the physiologic burden decreases, the incidence of failure decreases.[37a] Further evidence supporting this concept is drawn from the clinical improvement during the final month of pregnancy in the circulatory status of patients with chronic congestive heart failure. Obvious and clearcut clinical improvement has occurred in such patients, who, although at strict bed rest and under optimum treatment for several weeks or longer, had previously failed to show significant change. In other words, as the circulatory burden diminished during the tenth lunar month of pregnancy, there was associated clinical improvement of congestive failure in patients of the type described (chart 4). The practical lesson to be drawn from this is that in early pregnancy, with the burden increasing, the onset of heart failure usually demands termination of the pregnancy after compensation is restored. In the latter part of pregnancy one may safely await, in most instances, delivery through the pelvis at term, as the circulatory burden can be expected to decrease before delivery. One might almost be tempted to add a statement to the effect that one should be especially careful with pregnant cardiac patients during the sixth to ninth lunar months and supervise them most closely during that period, as it is the period of increasing burden; however, these patients must be supervised carefully during the entire course of pregnancy. Of course these rules are not absolute; they are, however, of great practical value and are based on both physiologic and clinical observations. The results in this clinic of treatment based on these rules [41] bear further testimony to their validity.

There are no quantitative studies which throw any light on the question as to which constitutes the greater "strain" on the heart, pelvic delivery or cesarean section. In the absence of quantitative studies we may venture the clinical impression that labor as conducted in cases of cardiac disease [42] at the Boston Lying-in Hospital is not a particularly great burden on the heart, probably not a greater one than the activities of the patient at home preceding labor or those attendant on the care of the child after delivery. As compared with cesarean section, with its common postoperative accompaniments of pain, distention and slight fever, delivery through the pelvis, as described, would seem to be associated with much less "cardiac strain." However, the proper evaluation of these two methods of delivery is an obstetric problem and probably will always remain one.

As a result of our studies covering five years, a few general points suggest themselves which may be helpful to others who plan to study the problems of pregnancy. Before studying pathologic problems in pregnancy it is wise to become acquainted with normal pregnancy, both the physiologic and the clinical picture. The normal pregnant woman varies in many ways from the nonpregnant woman, and many errors have been made because of the lack of appreciation of this fact. Though one cannot attribute to the pregnancy all changes that occur in a pregnant woman, certain specific and characteristic changes do occur in normal pregnancy and should be recognized. The most fruitful studies of pregnancy seem to be those begun in the early part and continued through delivery and into the postpartum period. In a series of pregnant women, a significant number have some complication, such as toxemia, pyelitis or hemorrhage, which vitiates the study; therefore it is advisable to allow for this by starting with a larger number of patients than would otherwise be necessary. The obstetric literature is sadly lacking in studies on patients observed before the first pregnancy and through several pregnancies and the intervening periods. Complete studies of this type would no doubt settle many disputed points and seem indicated.

41. Irving, F. C.: Personal communication to the authors.

42. Analgesia during the first stage of labor and elimination of the second stage of labor by forceps extraction with ether anesthesia at full dilatation.

SUMMARY AND CONCLUSIONS

A careful evaluation of the variations in the cardiovascular status of the normal pregnant woman, with special regard to signs and symptoms, is necessary for avoidance of erroneous diagnoses of heart disease in normal pregnant women or heart failure in pregnant women with heart disease.

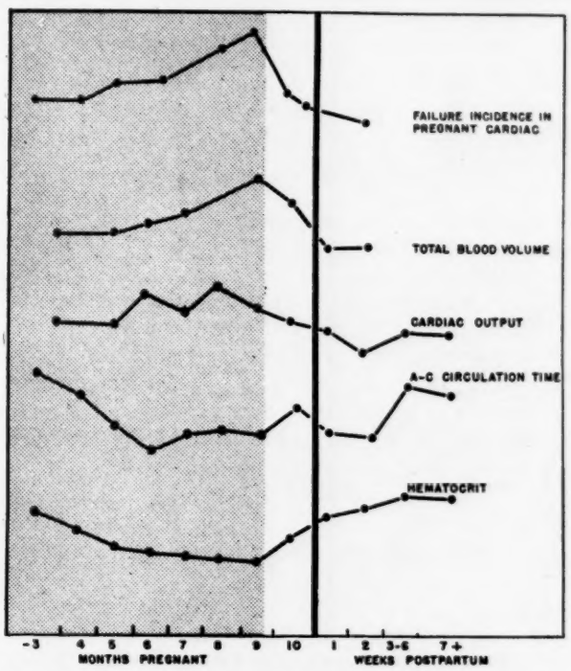

Chart 4.—Circulatory burden on the heart in pregnancy. The dark area shows the time of increasing physiologic burden on the heart coincident with the increase in incidence of heart failure; the unshaded area shows the decrease of the burden ante partum, with coincident decrease in the incidence of heart failure. The heavy perpendicular line represents delivery and separates the antepartum and the postpartum period. Quantitative data for these curves appear in chart 3. The curve for cardiac output is from the data of Burwell.[22]

The vital capacity usually increases slightly during pregnancy; a significant decrease in vital capacity in a pregnant woman with heart disease forecasts impending heart failure and provides the earliest objective sign of it (charts 1 and 2).

The results of the physiologic studies of the circulation of pregnant women which contribute most information as to the circulatory burden may be summarized as follows:

1. The blood volume, velocity of blood flow and cardiac output increase during pregnancy to the ninth lunar month and then decrease prior to delivery.

2. The hemoglobin content and red corpuscle count per unit volume of blood and the hematocrit reading and viscosity of the blood decrease during pregnancy to the ninth lunar month and increase prior to delivery (chart 3).

Active rheumatic fever is not a significant factor contributing to heart failure during pregnancy and is notably rare at that time.

The significant factors predisposing to heart failure in pregnancy are, however, the physiologic changes just described, particularly the increase in blood volume, cardiac output and velocity of blood flow.

The onset of heart failure in pregnant women with cardiac disease occurs most frequently at the phase of pregnancy associated with the maximum increase in blood volume, velocity of blood flow and cardiac output. The frequency of heart failure diminishes during the last weeks of pregnancy and corresponds to the decrease in the values of these circulatory functions (chart 4).

It follows from both physiologic and clinical observation that heart failure in early pregnancy may be expected to grow worse as the circulatory burden increases and to improve during the predelivery period, as the circulatory burden diminishes.

THE MECHANISM OF ACTION OF QUININE IN MYOTONIA AND MYASTHENIA

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Wolf [1] was the first to point out the ability of quinine to relieve the difficulty in the muscular relaxation of patients with myotonia congenita and myotonic dystrophy. Later Kennedy and Wolf [2] commented on the increase in muscular weakness produced in patients with myasthenia gravis by the administration of quinine and, conversely, the increase in the degree of myotonia after the administration of prostigmine. These observations were fully corroborated by Kolb and his associates,[3] who suggested that prostigmine would be of value when diagnosis was difficult, as in the condition described by Curschmann [4] of myotonia sine myotonia. These authors also observed that small amounts of prostigmine could completely counteract the beneficial effect of quinine in myotonia, even when large doses of the latter drug were used. Harvey and Whitehill [5] had previously discussed the value of quinine in the diagnosis of early cases of myasthenia gravis, when the objective improvement following prostigmine was not sufficiently clear cut. They also pointed out that alarming symptoms of respiratory distress and dysphagia might result when a small dose of quinine was given to a patient with moderately severe symptoms of myasthenia.

In its actions on these two diseases potassium chloride has been found to exhibit a similar contrast, but in the opposite direction. Laurent and Walther [6] recorded improvements in myasthenia after oral administration of large amounts of potassium chloride, which they tried because of the observation of Feldberg and Vartiainen [7] that it increased the sensitivity of the response of the superior cervical ganglion of the cat to acetylcholine and to stimulation of the preganglionic nerve. Russell and Stedman [8] pointed out that it had an action similar to that of prostigmine in increasing the severity of the symptoms in myotonia.

Kennedy and Wolf [2] suggested that quinine was able to relieve myotonia by inhibiting the action of acetylcholine liberated at the motor nerve endings. As evidence in favor of this view they quoted the work of Stavraky,[9] who found that quinine acts directly as a paralyzing drug on the secretory fibers of the fibers of the auriculotemporal nerve. It was found, however, to inhibit the secretory effect of acetylcholine itself on the submaxillary gland, though physostigmine tended to restore to normal the action of the chorda tympani paralyzed by quinine. However, no really satisfactory explanation of these actions of quinine on diseases of human muscle has yet been formulated.

A pharmacologic investigation of the effects of quinine on neuromuscular conduction and on the contractile properties of skeletal muscle [10] has revealed certain features of its effects, which suggest an explanation of its mode of action in these diseases, though the complete explanation must await more adequate knowledge of the pathogenesis of myotonia and myasthenia. Only those of its effects which are concerned with the action of quinine in these two diseases will be discussed here. These are as follows:

1. Quinine decreases the ability of the muscle to respond to and to hold a tetanus. This is due to an effect directly on the muscle, which increases its refractory period.

2. The excitability of the motor end plate is lowered, so that the response to nerve stimulation is reduced. This is best seen in a partially curarized muscle. When quinine is injected under these conditions, the curarization becomes complete. This action is also in large part responsible for the abolition by quinine of the quick response of a muscle to injected acetylcholine. For other features of the action complicating this picture, reference may be made to my full paper on the pharmacologic effects. Brown and his associates [11] had previously shown that curarine could remove the response to injected acetylcholine more readily than response to a motor nerve volley.

3. The normal potentiation of the twitches caused by physostigmine, and due to repetitive response to a single nerve volley, is prevented by the previous administration of quinine or is counteracted promptly when the drug is injected during a period of potentiation. Weiss [12] had found that the fibrillary twitchings produced in the cat by physostigmine were abolished by the intravenous injection of quinine.

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From the National Institute for Medical Research, Hampstead, London, N.W. 3.

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4. The repetitive response to a single stimulus which occurs after veratrine is also removed by quinine. This occurs in both the normal muscle and the muscle of which the motor nerve has previously been cut and allowed to degenerate.

These observations offer a fairly satisfactory explanation of the effects of quinine in myotonia and myasthenia gravis, and also of the opposing action of prostigmine in these two conditions.

Although the exact nature of the disturbance in myasthenia gravis is not known, it has long been likened to partial curare poisoning [13] and, as such, attributed to a diminution in the excitability of the motor end plates in the involved muscles. Blake Pritchard [14] has shown that these muscles are not capable of maintaining a tetanus with a high frequency of nerve stimulation, although the tension developed in response to less rapid stimulation is normal and well maintained. His experiments again afford evidence for a depression of motor end plate response, a similar type of response occurring in a partially curarized mammalian muscle.[15] Lindsley [16] recorded the action potentials of voluntary contractions of single motor units in patients with this disease and found that they show an abnormal fluctuation in amplitude. This suggests that all the fibers in the single motor unit do not respond to every nerve impulse. These observations could be interpreted by supposing that the end plate threshold is raised in these patients or, as an alternative, that the concentration of acetylcholine released by an impulse is subliminal for the stimulation of some of the fibers. Any drug which has a curariform action, as quinine has, would in either case cause an increase in the severity of the symptoms. Physostigmine or prostigmine might act by retarding the destruction of normally subliminal charges of acetylcholine liberated at some motor nerve endings. On the other hand, the possibility is not excluded that these alkaloids may have an effect in lowering the threshold of end plate excitability, independent of their antiesterase actions. The fact that guanidine will relieve the myasthenic condition, as recently demonstrated by Minot and her associates,[17] shows that antiesterase action is not necessarily involved in such a remedial effect. Guanidine has no appreciable antiesterase action.[18] It may be noted in that connection that quinine, which has an opposite action to that of prostigmine in myasthenia, also has a definite, though relatively weak, inhibiting effect on the action of cholinesterase.[19]

The localization of the disturbance in myotonia is much less certain. Lindsley and Curnen [20] have demonstrated oscillatory action potentials during the period of the slow relaxation. They express the opinion that this indicates a neurogenic rather than a myogenic phenomenon, and they advance the hypothesis that the after-contraction is of reflex origin and due to persistent discharge of hyperexcitable end organs in the muscle. This theory, however, does not seem tenable, since anesthesia of the motor nerve does not abolish myotonia mechanically produced, as shown by Schaefer,[21] nor does spinal anesthesia, as demonstrated by Kennedy and Wolf.[2] In view of the fact that myotonia presents a contrast to myasthenia, both in its clinical features and in the responses given to various drugs, it seems most likely that the abnormality is one of neuromuscular transmission, the threshold of the end plates being lower, or the transmitter of excitation from the nerve endings being more slowly destroyed, than in the normal muscle. The response of the myotonic muscle to a single nerve volley would then, in either case, be similar to that of a muscle under the influence of physostigmine in that it would respond repetitively. Any drug with a curare-like action on the excitability of the end plates would then diminish this effect and alleviate the myotonus. On the other hand, it has been shown by Wilson and Wright [22] that potassium ions have an antagonistic effect to that of curare and lower the threshold at the motor end plates. It is therefore in accordance with expectation that potassium salts are beneficial in myasthenia gravis and increase the severity of myotonus.

There still remains, however, the possibility that myotonia is due to an abnormality of the whole muscle fiber rather than of the end plate alone, resembling that of a muscle treated with veratrine. It has been shown that the refractory period of skeletal muscle is increased by quinine and that this causes a diminution in the ability of even a denervated muscle to hold a tetanus and likewise abolishes the repetitive nature of the response under veratrine. This action of quinine would explain its effect in relieving myotonus, if this abnormality was due to a change in the muscle fibers, causing them to respond repetitively to a stimulus of any kind and not merely to the normal excitation through the nerve.

On the whole, however, my results with quinine strengthen my belief that the disturbances in these two diseases are at the motor end plates. Such a conception gives a reasonably satisfactory explanation of the effects of various drugs on the two conditions; but there is, as yet, no clue to the fundamental processes responsible for the suggested alterations in end plate excitability.

SUMMARY

1. The existing evidence suggests that myasthenia gravis and myotonia are due to abnormalities of neuromuscular transmission. If these are regarded as due to changes in the excitability of the motor end plates of the muscles involved, the excitability would be lower in myasthenia and higher in myotonia than in the normal muscle.

2. Quinine has a curare-like action by which it decreases the excitability of the end plates. This effect would account for its ability to improve myotonia and to increase the severity of the myasthenic state. Physostigmine and potassium chloride, as would be expected, both produce effects on these two conditions, which are in each case the opposite of those produced by quinine.

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SPONTANEOUS PNEUMOTHORAX IN ANTHRACOSILICOSIS

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Interest in the pulmonary dust diseases has been stimulated by their inclusion in many states among the compensable occupational diseases. The pathologic clinical and roentgenologic aspects of the pneumoconioses have been extensively described.

Spontaneous pneumothorax complicating pneumoconiosis has been reported from time to time, but there appear to be no definite data as to its frequency. Furthermore, there are no studies comparing the incidence of the condition in simple pneumoconiosis with the incidence in pneumoconiosis associated with tuberculosis.

Most reports concern pneumocotic tuberculosis, and Ickert [1] has stated that according to his experience and that of Redeker pneumothorax is found in pneumoconiosis only when the pneumoconiosis is associated with tuberculosis. During the past few years, however, spontaneous pneumothorax occurring in cases of pneumoconiosis without complicating tuberculosis has been reported with increasing frequency. Hofbauer [2] in describing such a case discussed two similar ones which had come to his attention. Ketterer,[3] Snyder,[4] Breton and Eloire [5] and Brulé and his co-workers [6] have considered this condition of sufficient rarity to report individual cases in detail. De Léobardy and Pasquet [7] have called attention to a case of bilateral pneumothorax occurring under similar conditions.

TABLE 1.—*Summary of Cases*

	Number of Cases	Cases of Pneumothorax	Percentage
Anthracosilicosis, uncomplicated	199	7	3.5
Anthracosilicosis, complicated	308		
By tuberculosis	307	14	4.5
By carcinoma	1	1	
Total	507	22	

To determine the frequency of spontaneous pneumothorax as a complication of pneumoconiosis, we have reviewed the records of 507 anthracite coal miners incapacitated by chronic pulmonary disease. All these men had anthracosilicosis; 308 (60.7 per cent) had coexisting pulmonary tuberculosis and one had metastatic pulmonary carcinomatosis.

Pneumothorax occurred spontaneously in twenty-two (4.3 per cent) patients. Among the 199 patients with simple anthracosilicosis it was found in seven (3.5 per cent). Among the 307 patients with coexisting tuberculosis it was seen in fourteen (4.5 per cent); it also occurred in one instance in association with pulmonary metastasis (0.3 per cent) (table 1).

The ages of the patients ranged from 25 to 52 years and they had been exposed to mine dust for periods ranging from three to thirty-six years (table 2).

Eight patients had second stage and fourteen third stage anthracosilicosis. In three instances the pneumothorax was bilateral, in nineteen unilateral. Of the cases of unilateral involvement, the left side was affected in eleven and the right side in eight.

In five patients pleural effusion developed. In three the anthracosilicosis was uncomplicated; in two there was coexisting tuberculosis. In only one, however, was there sufficient fluid to require removal.

Of the seven patients with uncomplicated anthracosilicosis, one died. Of the fifteen with a complication, the patient with carcinomatosis and ten of the fourteen with tuberculosis died.

The diagnosis of uncomplicated anthracosilicosis was made by applying the criteria for the differentiation of simple anthracosilicosis from anthracosilicotic tuberculosis described by one of us (M. J. S.).[8] Repeated analyses of the sputum showed no tubercle bacilli, and no evidence of tuberculosis was found on serial x-ray examination. In addition, there was no severe hemoptysis, marked toxemia or extensive cavity formation and no extrapulmonary tuberculous complication. In one case no evidence of tuberculosis was seen at necropsy.

CLINICAL AND ROENTGENOLOGIC FEATURES

Advanced pneumoconiosis is always associated with inflammatory reaction in the pleura, and in this group of anthracosilicotic patients evidence of extensive adhesions was found in every case. The symptoms produced by rupture of the pleura appeared to depend primarily on the extent to which the pleural space was obliterated by these adhesions and were in the main the result of further reduction of the breathing capacity in persons already having considerable dyspnea because of preexisting pulmonary disease.

In a few patients small encapsulated collections of air were seen. These produced no symptoms and were discovered only by routine x-ray examination; the air was eventually absorbed and the clinical course unaffected. In all but one case the localized pneumothorax was located in the upper part of the chest.

In patients in whom the pleural surfaces were sufficiently free to permit the collection of a large amount of air, perforation of the pleura was of serious consequence. Perhaps the most striking feature in this group was the extreme distress caused by a combination of intense dyspnea and a sense of impending suffocation. Severe pain in the chest and a feeling of constriction or pressure on the affected side were common complaints, and the symptoms of shock were present in many cases.

The severe reactions precipitated by spontaneous perforations of the pleura were poorly borne. This was especially true of the patients who prior to the accident were greatly debilitated or markedly dyspneic. The severity of this accident is reflected in the high mortality with which it is associated, particularly in the group with superimposed tuberculosis. One patient died within a few minutes after the accident, one three hours after and two within twenty-four hours.

From the White Haven Sanatorium, White Haven, Pa.
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8. Sokoloff, M. J.: Anthracosilicosis and Tuberculosis, Am. Rev. Tuberc. **34**: 700-711 (Nov.) 1936.

The x-ray picture of pneumothorax in association with anthracosilicosis has certain distinctive characteristics. The dust-laden lung, containing as it does an excessive amount of fibrous tissue, is still of considerable volume, even when collapsed under high pressure. There are in addition, nearly always, extensive adhesions which partially anchor the lung to the wall of the chest at one or more points. Because of these two factors, the increased density of the lung parenchyma and the adhesions, the compressed lung is not as greatly reduced in volume as when pneumothorax occurs in other conditions, nor is it pushed as far downward and backward; instead, it is suspended as a compact mass in the pneumothorax cavity. The fixed semirigid lung acts as a shield and prevents the full force of the increased pressure from being directed against the heart and the mediastinal structures. Thus shifting of the heart and mediastinum is not as extreme as with high-tensioned pneumothorax associated with other conditions. The main force is exerted on the diaphragm and the thoracic wall, so that downward displacement of the diaphragm and increase in size of the thorax on the affected side are nearly always present, particularly if the pneumothorax space is large.

Roentgenologically, pneumothorax has to be differentiated from emphysematous blebs and pulmonary cysts. The three conditions are characterized by increased aeration of a part of the pulmonary fields. However, attenuated bands of pulmonary tissue can usually be made out in the blebs and cysts, while they are absent in pneumothorax. When the pneumothorax is large or occupies the lower lateral aspect of the thoracic cavity, the edge of the lung can be seen. The pneumothorax frequently changes in size, while blebs and cysts present a more or less constant appearance.

BILATERAL SPONTANEOUS PNEUMOTHORAX

Simultaneous bilateral spontaneous pneumothorax complicating pneumoconiosis is rare. In a comprehensive review of the literature Glickman and Schlomovitz [9] found only six cases, and to these they added one of their own.

Our series of twenty-two cases includes three in which the perforations were bilateral. One of these has been previously reported by Norris and Landis [10] and is included in the group collected by Glickman and Schlomovitz.

CASE 1.—A man aged 41, who had been employed in the mines for twenty-nine years, had third stage anthracosilicosis complicated by tuberculosis, with tubercle bacilli in the sputum. There was a great amount of air in both pleural cavities, but this was entirely absorbed before his death, which occurred three months after the perforation.

CASE 2.—A man aged 43, who had been exposed to mine dust for ten years, had third stage anthracosilicotic tuberculosis, with tubercle bacilli in the sputum. The pneumothorax was asymptomatic, with a collection of air along the lateral margin of the upper lobe of the right lung and a small pocket of air over the upper lobe of the left lung. This patient also died.

CASE 3.—A man aged 51, who had been engaged in coal mining for thirty-six years, had perforations which occurred suddenly and were characterized by severe pain in the chest and collapse. X-ray examination revealed advanced third stage pneumoconiosis, with both lungs partially compressed by pneumothorax. On the right side the air collected at the base and on the left over the upper lobe. No tubercle bacilli were found in the sputum on repeated analyses, but the patient was considered to be tuberculous because of the x-ray picture and the severe toxemia. He is still under treatment, and with him also there has been absorption of the air, with complete reexpansion of both lungs.

CONCLUSIONS

Conditions which favor the development of spontaneous pneumothorax are always present in anthracosilicosis, either as a direct result of the action of the dust or as a complication. Emphysema, which plays an important part in the production of spontaneous pneumothorax, is a constant accompaniment of anthracosilicosis. Bleb formation is frequent in association with this emphysema, and the tendency of the blebs to rupture constitutes a hazard in every anthracosilicotic patient. The possibility of the development of pneumothorax is further increased by the presence of adhesions, which may be responsible for the entrance of air into the pleural space by tearing the visceral pleura at their insertions. The coexistence of tuberculosis was another factor contributing to pleural accidents. Since tuberculosis is considered the most common cause of spontaneous pneumothorax, it is reasonable to assume that this condition should occur frequently in patients with anthracosilicotic tuberculosis. The severe cough, which is a predominant symptom, supplements the influence of these three factors, and the resulting strain may cause rupture of the pleura at its weakened points.

TABLE 2.—*Distribution of Cases*

Case Number	Age	Years of Mining	Stage	Type	Result
			Uncomplicated Anthracosilicosis		
1	47	20	2	Left hydropneumothorax	Unimproved
2	36	15	3	Right pneumothorax	Died
3	33	12	2	Left pneumothorax	Improved
4	50	27	3	Left hydropneumothorax	Improved
5	45	26	3	Left hydropneumothorax	Improved
6	37	13	2	Right pneumothorax	Improved
7	37	25	3	Right pneumothorax	Improved
			Anthracosilicosis Complicated by Tuberculosis		
1	51	30	3	Right hydropneumothorax	Unimproved
2	48	28	2	Left pneumothorax	Improved
3	51	25	3	Right pneumothorax	Died
4	39	17	2	Left pneumothorax	Died
5	50	27	3	Right hydropneumothorax	Died
6	36	18	3	Left pneumothorax	Died
7	41	29	3	Bilateral pneumothorax	Died
8	48	24	2	Left pneumothorax	Died
9	43	10	3	Bilateral pneumothorax	Died
10	25	3	2	Right pneumothorax	Died
11	36	13	2	Left pneumothorax	Died
12	51	36	3	Bilateral pneumothorax	Improved
13	52	30	3	Left pneumothorax	Died
14	48	28	3	Left pneumothorax	Improved
			Anthracosilicosis Complicated by Carcinomatosis		
1	48	25	3	Right pneumothorax	Died

It would appear therefore that in anthracosilicotic patients there exists a combination of conditions which are ideal for the development of spontaneous pneumothorax. However, in spite of the presence of so many factors which tend to produce perforations of the pleura, the accident occurred in only twenty-two (4.3 per cent) of a group of 507 anthracite coal miners.

The reason for this low incidence is revealed by study of the pathologic changes resulting from irritation by the dust. In most patients there is an inflammatory reaction in the visceral pleura accompanying that in the lung. This progresses as the amount of dust in the lung increases, so that in the extreme grades of anthracosilicosis tremendous pleural thickening results. In other patients both the visceral and the parietal layers of the pleura are involved in the reaction, leading to

9. Glickman, L. G., and Schlomovitz, B. H.: Simultaneous Bilateral Spontaneous Pneumothorax Complicating Pneumonoconiosis, Am. Rev. Tuberc. 34: 390-401 (Sept.) 1936.

10. Norris, G. W., and Landis, H. R. M.: Diseases of the Chest and Principles of Physical Diagnosis, ed. 5, Philadelphia, W. B. Saunders Company, 1933, p. 720.

obliteration of the pleural space. Since the thickened or adherent pleura can be neither perforated nor torn easily, it affords definite protection against the development of spontaneous pneumothorax and tends to overcome the effect of the factors producing the condition.

SUMMARY

Twenty-two cases of spontaneous pneumothorax were found among 507 coal miners disabled by anthracosilicosis (4.3 per cent). Seven cases were among 198 patients with simple anthracosilicosis (3.5 per cent) and fourteen among 308 patients with coexisting tuberculosis (4.5 per cent). In one case the lesion occurred in association with pulmonary metastasis.

In three instances the pneumothorax was bilateral. Two of these, reported here for the first time, make a total of nine cases of bilateral spontaneous pneumothorax in pneumoconiosis reported in the literature to date.

The conditions may be either asymptomatic or associated with severe symptoms; for the latter type the prognosis is grave.

Emphysema, pleural adhesions, tuberculosis and the accompanying severe cough favor the development of pneumothorax in anthracosilicosis.

The effects of these forces are largely overcome by thickening of the visceral pleura or obliteration of the pleural cavity, practically constant features of anthracosilicosis.

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POSTURAL TREATMENT OF ACUTE LARYNGOTRACHEOBRONCHITIS

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With tragic abruptness a child with an apparently ordinary infection of the upper respiratory tract with moderate difficulty in breathing may choke up suddenly, fight desperately for air for a short time and die, and at autopsy the appearances of acute laryngotracheobronchitis are found. Though there may have been few physical signs, the tracheal and bronchial mucosa may be red, thick and even ulcerated, the bronchi and bronchioles may be filled with thick secretions, plugs or crusts, and areas of the lungs may be atelectatic or emphysematous.

Some men have never recognized such a condition and consider it a rarity. Others who have not seen what early and proper treatment can do for it think it hardly more than an academic problem to be studied post mortem. In the light of published experiences there can be no doubt that it occurs often and that, while it is serious, with decision, energetic treatment and unremitting care the prognosis may not be bad. Ten cases of this condition in which cannulation was required are here reported, with two deaths.

A rather clear picture of the condition has been given in the past twenty years by Baum,[1] Gittins,[2] Jackson,[3] Richards,[4] Smith[5] and others. Certain facts seem to have been rather definitely established, and these will be briefly reviewed. If not indeed a true clinical entity, it has definite recurring characteristics determined by anatomic, physiologic and bacterial factors. Its occurrence is not very rare, and it may be reported more often when it is generally appreciated and recognized. The mortality, according to Jackson,[3] averages 70 per cent, although large group reports vary from 33 to 75 per cent.

Symptoms are likely to include those of a mild infection of the upper part of the respiratory tract followed by cough, hoarseness, increasing stridor, restlessness, dehydration, sepsis of varying degree and signs of cardiac and general exhaustion. Obstructive symptoms usually dominate the picture, though these may be slight if the obstruction is low in the bronchial tree or if sedatives have been given. Cyanosis is an alarming symptom, especially the pale cyanosis of exhaustion seen perhaps more often in low obstruction. The severity of symptoms is out of proportion to physical and roentgenologic observations.

Primary involvement may be chiefly of the larynx or subglottic areas, of the trachea or of the bronchi. Usually the process appears to descend from the larynx and the whole respiratory tree is likely to suffer. Richards[4] and others have well described the end state seen post mortem, and the Jacksons[3] have given in detail the living pathologic picture as related to the symptoms.

Diagnosis should not be difficult. Diphtheria, foreign body, croup, laryngismus stridulus and other causes of respiratory difficulty are to be ruled out, if necessary by direct laryngoscopy or by bronchoscopy. The sudden onset of cyanosis with restlessness, especially if not explained by physical signs and particularly in the type of case considered an atypical bronchopneumonia, should call into consideration this disease.

The following two points may be worth further discussion: 1. Progressive and irreversible changes are caused early by laryngotracheal obstruction in the presence of infection so that relief must not be long delayed. 2. Postural drainage and irrigation are valuable measures which have not been fully appreciated in treatment.

In order to visualize the processes of this condition, to understand the varying picture and to judge how soon it may be necessary to intervene to prevent irreparable damage, it may be useful to review some of the experimental work on obstruction of the airway as well as that on the pathogenesis of acute pulmonary infections.

Since 1844 many observers have shown that atelectasis and emphysema can be produced by bronchial obstruction. Coryllos and Birnbaum[6] attempted to show that the important condition was prevention of the entrance of air and absorption of that remaining. Jackson and Manges[7] demonstrated that foreign bodies especially of the vegetal type might have the same effect. Galbraith and Steinberg's[8] experiments seem to show

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Read before the American Laryngological Association, Atlantic City, N. J., May 2, 1938.

1. Baum, H. L.: Acute Laryngotracheobronchitis, J. A. M. A. **91:** 1097 (Oct. 13) 1938.

2. Gittins, T. R.: Laryngitis and Tracheobronchitis in Children, Reference to Nondiphtheritic Infections, Ann. Otol., Rhin. & Laryng. **45:** 1165 (Dec.) 1936.

3. Jackson, Chevalier, and Jackson, C. L.: Acute Laryngotracheobronchitis, J. A. M. A. **107:** 929 (Sept. 19) 1936.

4. Richards, L.: Fulminating Laryngotracheobronchitis, Ann. Otol., Rhin. & Laryng. **42:** 1014 (Dec.) 1933.

5. Smith, W. Jewell: Acute Laryngotracheitis in Children, Arch. Otol. **23:** 420 (April) 1936. This has a good recent bibliography.

6. Coryllos, P. N., and Birnbaum, G. L.: Obstructive Massive Atelectasis of the Lung, Arch. Surg. **16:** 501 (Feb.) 1928.

7. Jackson, C. L.; Spencer, W. H., and Manges, W. F.: The Diagnosis and Localization of Nonopaque Foreign Bodies in the Bronchi, Am. J. Roentgenol. **7:** 277 (Jan.) 1920.

8. Galbraith, E. G., and Steinberg, B.: The Developmental Mechanism of Pulmonary Atelectasis, Ann. Otol., Rhin. & Laryng. **46:** 800 (Sept.) 1937.

that the essential factor is interference with respiratory movements due often to obstruction but often also to other causes which prevent inflation and deflation of the alveoli, leading to secondary vascular changes. The changes that they considered most important are congestion, stasis, edema and transudation.

Kernan and Barach [9] emphasized the importance of these circulatory effects and concluded that "as a result of the continued obstruction and the elevated negative pressure in the chest, blood enters the right chamber of the heart and lungs more freely but is retarded in its departure from the lungs into the left heart as a result of the backward suction pressure on the left ventricle as it delivers blood into the extrathoracic aorta. The elevated negative pressure within the chest exercises suction on the capillary walls, which is the important factor in the production of intra-alveolar exudate." They believe that air is absorbed with production of atelectasis and that emphysema comes from increasing distention of the alveoli during inspiration, with rupture of blood vessels and giving way of damaged alveolar wall. Increasingly greater respiratory effort keeps up a vicious circle.

For a clearer picture of what happens when infection is superimposed on these mechanical factors one may turn to recent work on the pathogenesis of pneumonia. Nungester and Jourdonais [10] were able to initiate pneumonia in dogs by introducing bacteria protected by mucin. Edema fluid carries from this focus multiplying bacteria. The spread from the primary infection, according to Loeschke [11] after many postmortem examinations of human material, is by gravity and by positive pressure of exudate in a lung that has negative pressure. According to Gunn,[12] spreading areas coalesce and, if bronchi are not blocked, the exudate flows into open alveoli of lobe or lobule and there are deposits of fibrin, leukocytic infiltration and the progressive changes of pneumonia.

If fibrinous plugs or infected exudate block a whole lobe there may be lobar pneumonia, which Coryllos and Birnbaum [13] considered really massive atelectasis with infection by pneumococci.

In view of the experiments of Galbraith and Steinberg [8] it seems also that, if there is much secretion and yet not enough to block all the bronchioles and so cut off the interlobular peripheral airways of Van Allen,[14] lobular pneumonia may result. If a plug blocks a bronchus or if so many of the bronchioles are blocked by thick secretion that the peripheral interlobular respiratory mechanism does not operate, one can think that absorption of air and atelectasis might occur early before the open alveoli can fill with exudate, with the picture as it is in acute laryngotracheobronchitis.

The bacteria present, the reaction of the tissue to them and especially the character of exudate or transudate produced may have much to do with the end result, as already stated with regard to lobar pneumonia. Reports vary widely as to the organism most common in tracheobronchitis, the hemolytic streptococcus usually being given first place. Bradford and Leahy [15] believe that the usual cultural methods allow this organism to overgrow. By a careful plating technic they showed in a series of thirty-six cases that green-forming streptococci were predominating and that most cultures ran less than 5 per cent of the hemolytic streptococcus. The tissue reaction to this organism seems perhaps more compatible with the usual observations.

A rather narrow margin of chance may determine the end result in certain cases of respiratory infection. It may be that when primary obstruction is late or incomplete, and exudate early invades open alveoli, the picture is one of lobar or lobular pneumonia. If there is primary obstruction with absorption of air or if the primary process causes the outpouring of thick secretion or fibrinous plugs to block regional bronchioles before the alveoli are infected, atelectasis occurs, usually with emphysema. If the patient survives, the train of results may be as noted by Galbraith and Steinberg [8] in experimental animals: atelectasis, pneumonitis, local necrosis, abscess formation, with later lung abscess or bronchiectasis.

That the picture may be a composite of these two types of process is evidenced by many clinical observations. Holt [16] observed that emphysema occurred in the majority of children dying of lobular pneumonia. Snow and Cassasas [17] observed roentgenologically in many cases resembling bronchopneumonia patchy atelectasis and emphysema with shifting roentgen and physical changes. They noted that the greatest involvement was in the dependent portions. It is observed that cyanosis in lobular pneumonia, especially of the influenzal type, may be of rather rapid onset and out of proportion to the physical changes.

This also would indicate that many of these cases might be amenable to the treatment to be outlined, although, as Jackson,[3] Gittins [2] and others emphasize, many cases considered bronchopneumonia must be laryngotracheobronchitis. It is interesting to note that Kernan [9] did bronchoscopic aspiration in lobar pneumonia with reported benefit.

It may perhaps be assumed, then, that the sequence of events in acute laryngotracheobronchitis is somewhat like this: An infection involves the larynx and subglottic tissues, and congestion and edema lead to nearly enough complete obstruction to raise the negative intrathoracic pressure, with added congestion, edema, exudate and capillary damage. Then thick secretion blocks bronchi or bronchioles whose walls are already swollen. As spreading secretion blocks the regional bronchioles, the interlobular tracts are cut off, air in the alveoli becomes absorbed, the dependent portions become atelectatic and the overlying ones become emphysematous. Infection and local circulatory changes add to the exudate, to absorption of air, to atelectasis and to emphysema and put out of commission more lung bed and further embarrass the heart. Cardiac and general exhaustion may here draw the final curtain.

The foregoing has been detailed to show that the problem is not one simply of blocked airway with anoxemia and perhaps sepsis and increased cardiac and respiratory effort and finally exhaustion but that the

9. Kernan, J. D., and Barach, A. L.: Role of Helium in Cases of Obstructive Lesions in the Trachea and Larynx, Arch. Otolaryng. **26:** 419 (Oct.) 1937.

10. Nungester, W. J., and Jourdonais, L. F.: Mucin as an Aid in the Production of Experimental Pneumonia, J. Infect. Dis. **59:** 258 (Nov.-Dec.) 1936.

11. Loeschke, H.: Untersuchungen über die Kruppose Pneumonie, Beitr. z. path. Anat. u. z. allg. Path. **86:** 201-223 (Jan.) 1931.

12. Gunn, F. D.: Pathogenesis of Pneumonia, M. Clin. North America **22:** 3 (Jan.) 1938.

13. Coryllos, P. N., and Birnbaum, G. L.: Lobar Pneumonia Considered as Pneumococcic Lobar Atelectasis of the Lung, Arch. Surg. **18:** 190 (Jan.) 1929.

14. Van Allen, C. M., and Lindskog, G. E.: Collateral Respiration in the Lung, Surg., Gynec. & Obst. **53:** 16 (July) 1931.

15. Bradford, W. L., and Leahy, Alice D.: Acute Obstructive Laryngitis: Clinical and Bacteriological Study, Am. J. Dis. Child. **40:** 298 (Aug.) 1930.

16. Holt, L. E.: The Diseases of Infancy and Childhood, New York, D. Appleton & Co., 1920.

17. Snow, William, and Cassasas, C. S. B.: Obstructive Emphysema, and Atelectasis in Influenza, J. A. M. A. **109:** 1886 (Dec. 4) 1937.

process is much more complex. Grave secondary changes may at any time supervene and then any treatment may be unsuccessful.

In other words, the patient is likely to be saved early or not at all. This means that, if a trial of oxygen therapy and other measures does not give relief, tracheotomy is to be done without further delay. Cyanosis and rapid pulse are really late signs of imminent heart failure and must not be waited for.

In the condition herein discussed, bronchoscopic aspiration is often a necessary and life-saving procedure. As an adjunct, postural drainage seems to have been neglected, as there was no emphasis on its use in tracheobronchitis, even though mention is frequently made of the adverse effects of gravity on secretion. Postural treatment is widely used by chest surgeons and internists, but there is little about it in the medical literature.

Nelson [18] showed that even in bronchiectasis, in which sputum is viscid and tenacious, proper postural drainage was very effective and resulted in at least temporary cures. He insisted on the patient lying inverted with the hips over a double inclined plane, with the position maintained for days or even weeks with only very brief interruptions. Cures by it have been seen in early cases of bronchiectasis in children, and it is usually part of the medical routine in abscess of the lung.

One pediatrician [19] who sees many patients states that for a year he has treated influenza by postural drainage and has not had one case of pneumonia develop in such patients.

Postural drainage must be such that a real gradient is maintained from the main lower bronchial area to the trachea and larynx. According to Morlock [20] this should mean at least 15 degrees elevation of the foot of the bed, but better as much as the patient will tolerate, which will increase with use. In children the prone position with the foot of the bed raised provides a much better gradient and it is usually accepted easily.

Having in mind the physiopathology of acute laryngotracheobronchitis it would seem that here postural drainage would be especially valuable. The usual protective mechanism fails, secretion not being moved by cough, tussive squeeze or ciliary action. Secretion as it is first formed, whether as mucus, transudate, exudate or hemorrhage poured out in trachea, bronchi or bronchioles, must first be fluid and will flow some distance along the dependent wall before it forms plugs or crusts. At first at least ciliary action probably helps, and Leonard Hill [21] showed that cilia from the horse's trachea moved material twice as fast in the horizontal as in the vertical position. Murphy [22] injected into the bronchi of cats material of the viscosity of secretions found in asphyxia neonatorum and demonstrated that gravity drainage would clear the tracheobronchial tree.

If secretion can flow to the areas of greater cough reflex, tussive squeeze and cough will be much more effective. If any cough, squeeze or ciliary action is left, the help of gravity will be important. If secretion stagnates, it should be as a spread dependent layer and not as an occluding mass lying in a bronchial well. If plugs or crusts form, they will be nearer the outlet as we have observed bronchoscopically after instituting postural drainage and will be more likely to be expelled by cough, or will be more accessible to removal by aspiration or bronchoscopy.

Lavage of the respiratory tract has been proved feasible by Stitt [23] and by Minter,[24] the latter using as much as 400 cc. of fluid at a time in adults. Gittins [2] in tracheobronchitis used epinephrine and physiologic solution of sodium chloride in small amounts, aspirating it afterward. Richards [4] showed that solution of sodium bicarbonate tends to soften and dissolve plugs.

If one is to use fluid it would seem that after it is instilled the inverted posture should be used to guarantee its return and also to aid in the movement of secretion and plugs toward the tracheotomy opening. In recent cases from 4 to 15 cc. of from 3 to 5 per cent of warm solution of sodium bicarbonate at a time has been dropped into the tracheotomy tube with inspiration, usually with the gratifying result that it stirred up vigorous coughing, so that it was presumably drawn back and forth over crusts and plugs. This was carried out with the head elevated and the child turned toward the side on which the stethoscope indicated the greatest blocking. The head was then lowered and suction was used by a catheter through the tracheotomy tube. Physiologic solution of sodium chloride or Ringer's solution followed to wash out the sodium bicarbonate. Intermittently when there was much blocking epinephrine solution 1:10,000 was used; the stronger solution is known to produce undesirable secondary congestion in the nose. This treatment has proved of much value in recent cases, although it cannot supplant entirely bronchoscopic aspiration and forceps removal of crusts. It proved especially valuable in cases in which even a 3.5 mm. bronchoscope could not be passed. A capable intern can be trusted to use postural irrigation and save the laryngologist constant attendance and the patient tiring bronchoscopies.

SUMMARY

The treatment, briefly outlined, is as follows:

1. Rest—physical and mental—so that minimum oxygen is required.
2. No opiates or atropine.
3. Oxygen by tent, hood or catheter or into the tracheotomy tube. It is better given with helium with moderate positive pressure according to the principles of Kernan and Barach.[9]
4. Fluids by mouth and parenterally to relieve dehydration and increase fluidity of secretion.
5 Moisture-saturated air by croup tent.
6. Tracheotomy or, rarely, intubation; not delayed if the foregoing procedures do not soon give relief.
7. Postural drainage and aspiration.
8. Postural irrigation if secretion, plugs or crusts cause blocking.
9. Bronchoscopic removal of crusts if necessary.
10. Expectorants (?).

Of the ten patients who required cannulation in my service at the Evanston Hospital, two died. The cases were favorable because they were usually referred early by alert pediatricians, whose collaboration in the general care was invaluable. Some of these patients were seen every few hours day and night for four or five days, and no cases are included from a service of a larger charity hospital where I could not be in frequent attendance. In all it appeared certain that tracheotomy

18. Nelson, H. P.: Postural Drainage of Lungs, Brit. M. J. **2**: 251 (Aug. 11) 1934.
19. Aldrich, C. A.: Personal communication to the author.
20. Morlock, H. V.: Lancet **1**: 381 (Feb. 13) 1937.
21. Hill, Leonard: Ciliary Movements in the Trachea, Lancet **2**: 802 (Oct. 20) 1928.
22. Murphy, D. P.: Influence of Posture on Movement of Fluid in Trachea of Newborn, Am. J. Obst. & Gynec. **27**: 118 (Jan.) 1934.
23. Stitt, H. L.: Bronchial Lavage for Disinfection and Immunization of the Bronchial Tree, J. Med. **14**: 576 (Jan.) 1934.
24. Minter, M. M.: Technic of Bronchial Lavage, South. M. J. **28**: 328 (April) 1935.

was inevitable. The two who died were seen only a few hours before death, and one had been given depressing doses of morphine. The series is too small, of course, for conclusions to be drawn, but it may indicate that with the measures here outlined the outlook in this disease is not too unfavorable.

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FAILURES IN THE TREATMENT OF URINARY TRACT INFECTIONS WITH SULFANILAMIDE

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Although introduced into clinical medicine less than five years ago, sulfanilamide has received abundant clinical trial. In adequate dosage the drug has already been proved to be most valuable in the treatment of infections caused by many organisms, especially the gonococcus and the beta hemolytic streptococcus. Why is it then that in some cases of such infections its use results in failure? Are the failures due primarily to resistance of individual strains of bacteria or are they due to some abnormality in the individual patient? Why are there such wide variations in the curative effects of sulfanilamide in cases of similar infections, perhaps even of the same strain?

In an attempt to answer these questions, we have undertaken the task of reviewing our failures in a fairly extensive use of sulfanilamide in urologic practice. In this study we include of course only infections ordinarily responsive to sulfanilamide and patients able to tolerate the drug in doses ordinarily effective and cooperative in other respects.

HOW DOES SULFANILAMIDE WORK?

The prompt control of many infections with sulfanilamide has aroused a decided revival of interests in chemotherapy and its mechanism. New concepts of man's fight against infection have arisen, and old ones are requiring many revisions. While there is still much to be learned about how this drug works, clinically sulfanilamide seems to produce three effects:

1. For certain organisms, notably the gonococcus, sulfanilamide has a definitely bactericidal effect in many cases.

2. Sometimes sulfanilamide merely limits the growth of the organism and does not eradicate it, the principal effect apparently being to prevent the extension of the infection to new regions.

3. Sometimes, however, sulfanilamide acts rather as an adjunct to the defensive mechanisms of the host.

It is not possible at this time to say definitely whether the effect of sulfanilamide is primarily on the susceptible organism or on the host's defensive mechanism. When sulfanilamide is diluted as much as it is in the blood stream, in vitro it appears to act as a bacteriostatic rather than as a bactericidal agent. The investigations of Long and Bliss [1] and others indicate that sulfanilamide acts in vivo by bringing about a change in the susceptible micro-organisms which permits phagocytosis. However, we are convinced that sulfanilamide also at times has a direct action in the fight against the gonococcus. For a number of years we have treated early gonorrhea in the male by sealing a 5 per cent solution of mild silver protein in the anterior urethra once daily for three or four days. Before the days of sulfanilamide this treatment was successful in obtaining a quick cure in from 15 to 20 per cent of suitable cases. With this treatment supplemented with sulfanilamide, this figure has now increased to 95 per cent, as already reported.[2]

Before the advent of sulfanilamide patients with gonorrhea were instructed to take fluids freely. This advice has been changed and now they are instructed to drink sparingly so as to obtain a higher concentration of the drug in the urine. As first determined by Helmholz [3] and confirmed by Farrell, Lyman and Youman,[4] when patients are taking sulfanilamide by mouth, sulfanilamide appears in the urine in sufficient concentration to be directly bactericidal. If the urethra is inflamed, patients are also instructed to void frequently in order to obtain the benefit of repeated flushing with urine containing sulfanilamide. This advice of course is reversed if toxic symptoms occur; then patients are urged to drink freely of water to hasten the elimination of the disturbing drug.

It should be noted that patients who discontinue the use of sulfanilamide too soon are apt to suffer a flare-up of the infection which often does not respond as well to a second course of sulfanilamide.

Numerous observers, however, have noted that better results were obtained in the treatment of gonorrhea when the use of sulfanilamide was started after the infection had been present for two weeks or longer.

Gaudin, Zide and Thompson [5] have observed that new organisms added at the time of transurethral prostatectomy were not killed as well by sulfanilamide as were bacteria present in the urine before the operation. They, like many others in England and in Europe, think that sulfanilamide stimulates some mechanism closely related to natural immunologic defenses.

In the clinical use of sulfanilamide it was soon observed that patients taking it did not have the usual percentage of troublesome prostatic infections. The reason for this was later explained by the experimental work on dogs by Farrell, Lyman and Youman,[4] who noted that sulfanilamide was eliminated in prostatic secretion in concentration high enough to be bactericidal.

Welsh, Wentworth and Mickle,[6] in a recent study of the infection which causes undulant fever, observed that the serum of patients or animals infected with Brucella organisms, when treated with sulfanilamide, was active in stimulating phagocytosis even after all the sulfanilamide had been excreted. The opsonic power toward Brucella of the blood of uninfected human beings or guinea pigs was not stimulated by sulfanilamide, a fact

Read before the Southwestern Branch of the American Urological Association at Dallas, Texas, Oct. 21, the New York Branch at New York, Nov. 10, and the Philadelphia Branch at Philadelphia, Nov. 28, 1938.

1. Bliss, Eleanor A., and Long, P. H.: Observations in the Mode of Action of Sulfanilamide, J. A. M. A. **109:** 1524 (Nov. 6) 1937.

2. Ballenger, E. G.; Elder, O. F.; McDonald, H. P., and Coleman, R. C.: Sulfanilamide: I. General Discussion of the Drug; II. Sulfanilamide with the Sealing Treatment of Beginning Gonorrhea; III. Sulfanilamide in Combination with Artificial Fever, South. Surgeon **7:** 204 (June) 1938.

3. Helmholz, H. F.: Bactericidal Power of Urine after Administration of Prontylin by Mouth, Proc. Staff Meet., Mayo Clin. **12:** 244-245 (April 21) 1937.

4. Farrell, J. I.; Lyman, Yale, and Youman, G. P.: Rationale of Sulfanilamide in Gonococcic Urethritis, J. A. M. A. **110:** 1176-1177 (April 9) 1938.

5. Gaudin, H. J.; Zide, H. A., and Thompson, G. J.: Use of Sulfanilamide after Transurethral Prostatectomy, J. A. M. A. **110:** 1887-1890 (June 4) 1938.

6. Welsh, Henry; Wentworth, J. A., and Mickle, F. L.: The Use of Sulfanilamide in the Diagnosis and Treatment of Brucellosis, J. A. M. A. **111:** 226-231 (July 16) 1938.

which indicates that an infective or immunizing process must be in progress for the drug to stimulate phagocytosis in this disease.

On the basis of experimental work, Mellon, Locke and their associates [7] have concluded that the mechanism of the bacteriostatic action of sulfanilamide may be correlated tentatively with the host's resistance to infection. In numerous experiments they observed that "fitness" of the host is a prime factor in the eradication of the infection. When the temperature of rabbits is artificially lowered several degrees the animals exhibit great variations in the length of time required for their temperature to return to normal. This served as an index to "fitness," for those rabbits whose temperature returned to normal most quickly were most successful in combating pneumococci injected into the blood stream. They determined further that "fitness" may be increased by artificial fever, vitamin B_1, vitamin C, liver extract and adrenal cortex extract.

There appears then to be a relationship between the duration of the infection and the response to the sulfanilamide. While sulfanilamide is in some way effective in controlling the growth of many kinds of bacteria in vivo, it certainly involves other factors than the direct action of the drug on the bacteria.

SULFANILAMIDE WITH HYPERPYREXIA

Gonorrheal infections which were expected to yield to sulfanilamide but for some reason proved resistant without exception have been promptly benefited when the use of sulfanilamide was supplemented with artificial fever. We have also employed these two agencies simultaneously when for urgent business or domestic reasons an early cure of gonorrhea was essential. Patients whose physical condition was such that they could not be submitted to a major surgical operation with reasonable safety were regarded as unsuitable for artificial fever treatment. In suitable cases as a rule an oral temperature of 103 or 104 F. was maintained for three or four hours. When the pulse rate exceeded 140 the short wave current inducing the fever was discontinued regardless of the temperature obtained. These bouts of fever were given every other day until three or four had been administered. So used, artificial fever has proved safe and efficacious in reenforcing sulfanilamide therapy. It should be noted that in our work the patient's temperature is not carried to the thermal death point of the infecting micro-organisms and that the duration of the treatment is less than that usually recommended.

In our efforts to find other facts bearing on this subject, cultures of several types of organisms were subjected to (1) sulfanilamide alone, (2) heat alone and (3) the combination of these two remedies. The organisms employed in these tests were gonococci, streptococci, colon bacilli and staphylococci. There is, as is well known, a wide variation in the response of these organisms to germicidal agents and to heat. In our tests, however, the combination of the two agents was always more effective than either alone. This was found true whether the tests were carried merely to the point of bacteriostasis or to complete sterilization of cultures. While these tests in vitro showed that the combination was more efficacious than either alone, the results were never sufficiently good to explain the satisfactory clinical results with the combined treatment.

Why is this combination more effective than either agent employed alone? The answer seems to involve a number of factors: (1) those which concern the physiologic phenomena associated with the defense mechanism of the host, (2) those which concern the thermal sickening point or thermal death point of the infecting micro-organisms and (3) those which have to do with the concentration of sulfanilamide in the urine, blood stream, serum and tissues brought about by the profuse sweating incident to the artificial fever. In our investigations of this concentration we have noted in some instances that the level of sulfanilamide is increased in the blood as much as 25 per cent and in the urine from 35 to 50 per cent.

Our concept of the value of artificial fever has been supported in recent experimental work by Mellon.[7] Commenting on the reenforcement value of artificial fever in the treatment of rabbits having blood stream infections with type I pneumococci, he said that the removal of these organisms from the blood stream "was effected more rapidly in the sulfanilamide rabbits than in the controls; more rapidly still in those given artificial fever and with maximum rapidity in the rabbits given both fever and sulfanilamide."

In the combined attack on the infection, artificial fever appears to act like a call to arms. Body tissues, serum and cells seem to be placed on a war time basis, with defensive agencies mobilized and activated. Or the chemical attack with sulfanilamide followed with hyperpyrexia may be likened to the gas barrage which handicaps soldiers so that they are more readily overcome by the bayonet charge.

PROTECTED FOCI, OR DEAD SPACES

While sulfanilamide in combination with hyperpyrexia has given us prompter and more satisfactory results than we have ever seen before, these combined measures failed to cause a cure in about one case in ten. In searching for the explanation of our failures, we noted that in such cases we were usually able to discover a protected focus or what, for lack of a better term, we call a dead space. Among important potential dead spaces may be mentioned para-urethral crypts, periurethral follicles, prostatic and other abscesses, seminal vesicles distended with stagnant secretions, areas of urethral strictures, residual urine in the renal pelves and bladder, diverticula of the bladder, cavities surrounding calculi and foreign bodies, Skene's glands, Bartholin's glands, plugs of mucus in the uterine cervix, cervical crypts, areas of salpingitis, rectal or anal crypts, infected synovial fluid and regions from which lymphatic drainage is blocked. These dead spaces we are convinced usually are not reached by an adequate amount of blood laden with sulfanilamide and associated defensive agents manufactured by the host. They therefore continue to harbor the bacteria, though at times any of them may become free from infection without the application of special local measures.

In our use of sulfanilamide in combination with hyperpyrexia it gradually became evident that consistently good results could not be obtained unless pocketed infections, or dead spaces, were eliminated before curative bouts of fever were given or unless they received especial attention while the patient was in the fever cabinet. The eradication of such foci preparatory to the combination treatment often resulted in the clearing up of the infection without the use of fever therapy.

7. Mellon, R. R.; Gross, Paul, and Cooper, F. B.: Sulfanilamide Therapy of Bacterial Infections with Special Reference to Diseases Caused by Hemolytic Streptococci, Pneumococci, Meningococci and Gonococci, Springfield, Ill., Charles C. Thomas, Publishers, 1938.

For example, we may cite again "sealing treatment." Apparently the mild silver protein takes care of the dead spaces afforded by the mucus and secretion in the anterior part of the urethra and sulfanilamide kills or assists in killing the deeper infection if taken before the infection becomes protected in a pocketed area.

The eradication of dead spaces however, it should be emphasized, did not result in a cure by sulfanilamide when sulfanilamide was not adequate for the control of the major part of the infection. Such failures probably were due to the lack of an immunizing response on the part of the host.

The instances of protected foci of different types have convinced us that such dead spaces are prime factors in the resistance of gonococcic infections to sulfanilamide.

MEASURES FOR SPECIFIC FOCI

Of the methods of dealing with localized infections in dead spaces, perhaps the most valuable is the employment of local heat during the fever treatment as a supplementary measure. In the case of epididymitis this heat is applied to the epididymis; in the case of perifolliculitis, to the penis.

The acutely inflamed prostate, with perhaps multiple pocketed abscesses or cavities laden with stagnant secretion, unfortunately does not excrete sulfanilamide as does the normal gland. Therefore it not infrequently becomes desirable to treat such a prostate with local heat in addition to routine massage. In chronically infected seminal vesicles also stagnant secretion acts as a protected focus and should be emptied from time to time.

Protected foci not infrequently are associated with or caused by urethral strictures, which should be dilated.

Abscesses in any part of the genito-urinary tract require drainage and suitable treatment to prevent, if possible, the development of fistulous tracts. If a fistula already is present, it should be laid open or treated with a concentrated germicide.

Plugs of mucus in the uterine cervix may act as dead spaces. Adair and his co-workers have shown that this mucus contains very little sulfanilamide. For such areas there is need, therefore, for assisting measures. In the routine treatment of pelvic inflammatory disease we employ a prolonged hot douche of the Gellhorn type; this cannot, of course, be administered while the patient is in the fever cabinet. Vaginal bags of the Elliot or Mills type afford means of carrying heat to the cervix and pelvic organs during the period of hyperpyrexia. The heat from the vaginal bag causes an increase in the uterine and vaginal discharge. This secretion, fresh from blood and tissues bearing sulfanilamide, appears to be of distinct curative value. If such treatment is not effective, employment of the high frequency current or cautery may be required to eradicate endocervical foci.

Synovial fluid in inflamed joints should be aspirated. If it recurs, the effusion is then from serum and tissues containing sulfanilamide and the immunizing agencies stimulated by it. Inflamed joints require local heat in addition to sulfanilamide and fever therapy.

INFECTIONS OTHER THAN GONOCOCCIC AND TUBERCULOUS

Only a few remarks will be presented on the nonspecific infections of the bladder and kidney. Here protected foci play an important part in preventing the cure of ordinary genito-urinary infections. These dead spaces are different from those previously discussed; chronic and recurrent infections are practically always associated with obstructive lesions of the urethra, vesical neck or ureter. Control of the residual urine is the prime object whether the stagnating urine is in the bladder or the renal pelves. The constant contact of urine containing sulfanilamide with the lining of these cavities, however, often can overcome the infection in spite of the residual urine. This statement does not hold when calculi, retention catheters or other foreign bodies are present. Persisting infection or recurring infection always should arouse suspicion of the existence of obstruction, stones, diverticula or pocketed areas.

Sulfanilamide appears to control or to limit the infection associated with transurethral resection of obstructing prostates, but it usually does not clear the urine of infection until the healing is complete. Its use is not necessary or desirable during the entire convalescence or in large doses, but it may be employed intermittently and always cautiously, because elderly men with poor kidney function are likely to have toxic reactions. The fuzzy mucus-like coating over the resected area appears to act as a dead space. The same thing is true for the coating of ulcerating carcinomas of the bladder.

SUMMARY

We desire to emphasize again the importance of recognizing protected foci or dead spaces as chief causes of failure in the treatment of genito-urinary infections and to direct especial attention to the fact that a longer time, a higher degree of immunity or a greater concentration of therapeutic agents is required for the eradication of infection from such foci than for the eradication of infection not so protected.

Although sulfanilamide is a most efficacious drug, it is not one to be used indiscriminately or over prolonged periods without an effort to reinforce its use with supplementary measures or without a search for protected foci in need of special local treatment.

Our clinical experience has shown that hyperpyrexia is the most dependable agent with which to reinforce sulfanilamide in the treatment of resistant infections.

NOTE.—Since this paper was read, confirmation of our conclusions has been offered by J. S. Lockwood (Observations on the Mode of Action of Sulfanilamide and Its Application to Surgical Infections, *Ann. Surg.* **108**:801-812 [Nov.] 1938). Lockwood showed that even a small amount of peptone or of peptone-like products greatly retards the germicidal activity of sulfanilamide. As far back as 1911 Bainbridge had shown that some species of bacteria are unable to break down the protein molecule to obtain essential nitrogen. In consequence they starve to death in serum protein or egg albumin unless predigested protein in the form of peptone is supplied. Lockwood asserted that pus and tissue undergoing necrosis contain peptone-like products which prevent sulfanilamide from acting on the micro-organisms with the maximal effect that characterizes its effect on diffuse nonsuppurative infections. In a later paper (Studies on the Mechanism of the Action of Sulfanilamide, THE JOURNAL, Dec. 17, 1938, p. 2259) Lockwood and his associates stated that relapses "were frequent in patients with localized infections containing necrotic tissue, such as mastoiditis and abscesses, whereas in bacteremia and erysipelas they were not encountered." They asserted that "the presence of débris, human or bacterial, diminished the effectiveness of sulfanilamide on the hemolytic streptococcus."

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METABOLISM OF THE BRAIN DURING INSULIN AND METRAZOL TREATMENTS OF SCHIZOPHRENIA

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A previous communication [1] appearing in THE JOURNAL was concerned with the possible effects of insulin and metrazol in patients with schizophrenia. The conclusions were based on observations of animals, but methods were used which did not duplicate those employed in the treatment of schizophrenia. The present communication presents a brief summary of the chief results obtained in patients with schizophrenia undergoing the insulin and metrazol treatments. Since these treatments change cerebral function, studies of cerebral metabolism were made.

TABLE 1.—*Average Oxygen and Dextrose Differences Between Arterial and Venous Cerebral Blood*

Condition	Number of Observations	Oxygen, Vol. per Cent	Dextrose, Mg. per 100 Cc.
Before injection of insulin	16	7.09	12.5
During hypoglycemic coma	26	3.07	4.16

The methods used for the study of the cerebral metabolism of the patients include the simultaneous collection of samples of arterial blood entering the brain and of the blood of the internal jugular vein, which represents the return flow from that organ. These samples are analyzed for oxygen and dextrose. The differences between the venous and arterial contents indicate the cerebral utilization of oxygen and dextrose.[2]

Table 1 discloses the average differences of the oxygen and dextrose contents between arterial and venous samples before the injection of insulin and during the hypoglycemic coma. The utilization of oxygen is diminished during coma from 7.09 volumes per cent to 3.07 volumes per cent. Assuming a constant blood flow, this indicates a diminished metabolism of the brain of about 55 per cent. However in hypoglycemia, according to Loman and Myerson,[3] the blood flow may be diminished, and the decrease of metabolism is therefore probably even greater than that indicated by the arteriovenous differences.

Thus the depressed cerebral metabolism and the coma are the direct results of the absence of carbohydrate, as the blood sugar diminishes in response to the injection of insulin. The brain, unlike other organs, oxidizes practically only one foodstuff, carbohydrate,[4] and as the available carbohydrate decreases the metabolism of the brain must necessarily diminish.[5] It should be pointed out, however, that during hypoglycemia the brain does not suffer from lack of oxygen. On the contrary, the oxygen content of the brain may rise, owing to the diminished utilization of that gas.

On the other hand, anoxia is developed during convulsions induced with metrazol,[6] for convulsions interfere with respiratory movements. Since it is physically impossible to draw blood from the internal jugular vein during the convulsions, only arterial samples were collected at this time. Table 2 discloses that during various stages of the convulsions the oxygen saturation of the hemoglobin of the arterial blood may decrease to 42 per cent, less than half the normal saturation of approximately 95 per cent. It is noteworthy that in these cases a moderate rise of blood sugar was noted after the initiation of the seizure. Even in the first moments after the convulsions are ended the oxygen saturation of the arterial blood does not attain normal values. Convulsions interfere temporarily with the oxygenation of the blood and therefore of the brain, thus diminishing cerebral metabolism. To contrast the fundamental differences of the actions of metrazol and insulin, the latter decreases the amount of coal (dextrose) necessary for the fire to support cerebral functions, while metrazol interferes with the draft (oxygen) required to maintain the flame. The end results, in regard to the supply of energy to the brain, are the same with the two methods.

Sakel [7] has reported that if convulsions occur during insulin hypoglycemia a dramatic improvement of the patient may be observed. Because of this fact he considers it advantageous sometimes to provoke convulsions by the injection of metrazol during hypoglycemia. It is significant that anoxia is produced by convulsions irrespective of the level of the blood sugar. For example, with convulsions occurring in response to low blood sugar (11 mg. per hundred cubic centimeters) an arterial hemoglobin saturation of 63 per cent was observed, while convulsions induced by metrazol during hypoglycemia resulted in a saturation of 61 per cent as blood sugar rose from 26 to 37 mg. per hundred cubic centimeters.

TABLE 2.—*Percentage Hemoglobin Saturation of Arterial Blood During and Immediately After Metrazol Convulsions*

Patient	Oxygen Content, Vol. per Cent	Oxygen Capacity, Vol. per Cent	Hemoglobin, per Cent	Blood Drawn in Regard to Duration of Seizure
Wi	18.97	22.62	84	First half
M	8.70	20.64	42	Late
Wi	16.45	23.11	71	Late
R	14.05	22.74	62	Late
M	11.17	22.99	49	Late
Wa	15.35	22.71	68	Late
R	11.43	22.74	50	Late
N	21.37	.....	..	After
Wi	17.60	22.16	78	After
M	15.93	20.58	77	After
F	16.28	21.99	74	After
Wa	20.43	22.71	90	After

This work was aided by a grant from the Child Neurology Research (Friedsam Foundation).

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6. Himwich, H. E.; Bowman, K. M.; Fazekas, J. F., and Orenstein, L. O.: Effect of Metrazol Convulsions on Brain Metabolism, Proc. Soc. Exper. Biol. & Med. **37:** 359-361 (Nov.) 1937.

7. Sakel, Manfred: The Pharmacological Shock Treatment of Schizophrenia, Nervous & Mental Disease Monograph Series, No. 62, 1938.

Thus convulsions occurring during hypoglycemia add to the effects of hypoglycemia those of anoxia and therefore involve both methods of diminishing the metabolism of the brain. This synergism permits the simultaneous utilization of the more prolonged action of insulin and the more severe one of metrazol. Though it is improbable that this diminished metabolism of the brain is the only factor involved, this review of the results obtained on patients with schizophrenia suggests that a depression of cerebral metabolism is associated with the initiation of the changes which lead to the amelioration of the disease. On this basis, patients with schizophrenia are now being treated with acute anoxia produced by the inhalation of nitrogen.[8]

Clinical Notes, Suggestions and New Instruments

VIRILISM IN WOMEN CAUSED BY ANDROGENIC THERAPY FOR MENSTRUAL DISTURBANCES

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An interesting phase of the endocrine therapy of gynecologic conditions has recently arisen with the introduction of testosterone propionate, an androgenic substance, in the treatment of certain menstrual disorders. Desmarest and Capitain,[1] Loeser,[2] Foss[3] and others have shown that this substance in doses varying from 400 to 2,000 mg. a month is capable of suppressing abnormal uterine bleeding. Loeser[2] has shown that at least 500 mg. of testosterone propionate must be given to suppress normal menstruation. It has also been reported that beneficial results may be obtained with smaller doses in cases of painful breasts and dysmenorrhea. The use of testosterone propionate in these conditions was suggested by its similarity in action to progesterone. In the rat and rabbit a progestational-like state of the endometrium was induced by administration of this substance. Furthermore, this androgen is capable of suppressing sex cycles of several species, inhibiting uterine contractions, neutralizing the action of estrogen on the vaginal mucosa and suppressing menstruation in monkeys and human beings, reactions which are typical of progesterone.

With the publication of the preliminary clinical reports on the use of testosterone propionate, a considerable wave of enthusiasm arose for the use of this substance in menstrual dysfunctions. The following report of two cases in which this substance was used is presented to deter physicians from the promiscuous use of androgenic therapy in females. The disagreeable side effects we have obtained with such therapy have definitely cooled our initial ardor, and, it is hoped, may serve as a warning to others.

REPORT OF CASES

CASE 1.—Mrs. A. F., aged 26, had been married six years and had never been pregnant. She consulted one of us (J. P. G.) Nov. 30, 1936, because of severe dysmenorrhea, which had been present since the onset of menstruation at the age of 13. This pain was so severe that the patient had to go to bed for two days every month. The monthly flow was profuse and at times alarming. After having tried numerous remedies the patient for a long time had used a combination of large doses of narcotics and a liberal quantity of whisky. The patient had had an appendectomy in 1935, and this failed to influence the menstrual pains.

Physical examination revealed that the head, neck, chest and abdomen were normal. Bimanual examination showed a nulliparous outlet, a slightly eroded cervix, a small, hard, anteflexed and movable uterus and normal adnexa. The Rubin test revealed patent tubes. The basal metabolic rate was —14 per cent, and biopsy just before menstruation revealed the endometrium in the late secretory stage. Hence ovulation was present.

Dilation and curettement were performed in the hope of giving some relief from the dysmenorrhea. The endometrium showed normal secretory epithelium. During the next five months the patient was almost free from pain at the time of the menses. Then the pain returned and at the same time the flow of blood became more and more profuse. Furthermore the menstrual periods lasted from ten to thirteen days instead of four or five days. April 30, 1938, menstruation was so profuse that the patient had to be taken to a hospital. At this time the basal rate was again —14 per cent. Before and after this episode various forms of medication had been given in an attempt to control the menorrhagia. These included thyroid, anterior pituitary-like substance, snake venom, solution of posterior pituitary, ergonovine and solution of parathyroid and calcium. Repeated bimanual examinations during all this time failed to reveal any abnormalities.

In June it was decided to try large doses of estradiol benzoate. The patient was given 10,000 rat units twice during the first week following her menstrual period and 2,000 rat units twice during the second week. This medication had no effect on the following menstrual flow, which was as profuse and as painful as the previous ones. It was then decided to give the patient testosterone propionate. The menstrual period had begun July 13. The patient was given 50 mg. of testosterone propionate July 18 and July 19, 100 mg. July 20, 22, 25, 27 and 29 and August 1 and 2 and 50 mg. August 5, a total of 850 mg. in nineteen days. A vaginal smear and a biopsy specimen were taken August 8, two days before the menstrual period was expected. The vaginal smear showed a decrease in the number of cornified cells. The biopsy revealed that the endometrium was in the follicular phase, in spite of the fact that the menses were to occur two days later.

August 23 the patient complained of an acneform rash on the chest, a large amount of hair on the upper lip and increase in weight. The menses, which had been due August 10, did not begin until August 29, nineteen days later. This period was just as painful as before.

It was decided to give a second course of treatment with testosterone propionate. The patient was given 50 mg. September 9, 12, 14, 16, 19, 21, 23 and 26 and 25 mg. September 28 and 30, a total of 450 mg. in twenty-two days. September 30 the patient complained bitterly that the hairs on the upper lip were rapidly increasing in number, length and darkness and that considerable hair was growing on her arms and legs. Likewise her voice was husky and her friends had been asking her about this. The weight had increased 10 pounds (4.5 Kg.) in spite of attempts to diet rigidly. The acne reappeared and was present not only on the chest but on the back. There had been a definite decrease in the size of the breasts. October 10 examination showed a distinct enlargement of the clitoris. This organ was reddened, as was the skin immediately surrounding it.

Menstruation did not return until November 1, an interval of sixty-four days having elapsed since the previous menses (August 29). The menses were painless and the flow was slight. The patient stated that she felt better than she had for more than a year. However, she still has her excess weight, hirsutism, acne and deep voice. The basal metabolic rate November 15 was +3 per cent. Bimanual examination revealed nothing abnormal. However, the clitoris was definitely smaller and there was no redness on or around it.

CASE 2.—Mrs. S. H., aged 22, came to see one of us (J. P. G.) Nov. 11, 1936, for premarital examination and advice. The past history was irrelevant, and the only abnormality in the menstrual history was severe dysmenorrhea. Rectal examination revealed large hemorrhoids and a fibroid on the right side of the uterus, which measured approximately 5 cm. in diameter. April 2, 1937, a few months after marriage, the fibroid appeared to be about 6 or 7 cm. in diameter. A discussion was had concerning the advisability of removing the fibroid, both because of the possibility that it was causing the

8. Himwich, H. E.; Alexander, F. A. D., and Lipetz, Basile: Effect of Acute Anoxia Produced by Breathing Nitrogen, on the Course of Schizophrenia, Proc. Soc. Exper. Biol. & Med. **39**: 367 (Nov.) 1938.

1. Desmarest, E., and Capitain, Mme.: Testosterone Therapy of Mastopathies and Disturbances of Menstruation and Menopause, Presse méd. **45**: 777 (May 26), 1109 (July 28) 1937.

2. Loeser, A. A.: The Action of Testosterone Propionate on the Uterus and Breast, Lancet **1**: 373 (Feb. 12) 1938.

3. Foss, G. L.: Action of Testosterone Propionate on the Female, Lancet **1**: 992 (April 30) 1938.

severe dysmenorrhea and because it might be better to remove the mass before the patient became pregnant.

Because of the patient's youth and the desire to wait for children, nothing was done. In July 1938 it was decided to give testosterone propionate and note its effect on the fibroid and the dysmenorrhea. A biopsy revealed an early proliferative stage of the endometrium. The menses began August 7. The patient was given 50 mg. of testosterone propionate August 15, 17, 19, 22, 24, 26, 29 and 31, September 2, 7, 9, 12 and 14, 25 mg. on September 16, 19, 21, 23, 26 and 28 and October 3 and 7, a total of 850 mg. in fifty-three days. On August 26 a biopsy specimen was taken. This showed an early proliferative phase.

August 28, thirteen days after the administration of testosterone propionate was started, a menstrual period began, and the patient had no pain at all (after 300 mg. of testosterone propionate). This period started seven days early. However, this bleeding began two days after the biopsy specimen was taken and may not have been a menstrual period. August 29 the patient complained that she had gained 6 pounds (2.7 Kg.) (after 300 mg. of the substance). September 16, bimanual examination showed that the fibroid was distinctly smaller, only about 4 cm. in diameter (after 650 mg.). Another biopsy specimen obtained on this day showed an early proliferative phase of the the endometrium. On September 19 the patient complained of an annoying acneform eruption on her face and arms. The weight was still increasing in spite of strenuous dieting. Furthermore, the patient's husband had been noticing a steadily increasing hoarseness in the patient's voice for more than a week. This continued to increase in severity until the voice sounded almost like a man's, especially over the telephone. Another biopsy specimen taken October 12 showed the follicular phase of the endometrium. November 2 the patient complained not only of persistent huskiness of the voice, acne and increase in weight but also of an abundant growth of hair on the upper lip and on the chin.

Bimanual examination November 7 revealed that the fibroid had increased in size again, almost to the size it was before the testosterone propionate was administered. The menses did not return until November 18, eighty-two days after the last menses (August 28). The deep voice, excessive hair and overweight were still present, but the acne had cleared considerably. The menstrual pains were about 50 per cent less than usual, but the amount of blood lost was much greater than usual. Bimanual examination November 23 showed the same condition as on November 7.

COMMENT AND CONCLUSION

An analysis of these cases reveals that testosterone propionate in doses which are effective therapeutically is potent in the induction of a significant degree of virilism. Growth of hair on the face and body was stimulated and a lowering of the voice to a masculine pitch was obtained in both cases. Enlargement of the clitoris, however, was observed in only one. It was first expected that these masculine developments would regress soon after the cessation of injections. The clitoris in the one case has returned to normal, but the hirsutism and male voice have persisted to the present time, eight weeks after the last injection of testosterone propionate. It should be noted that menstruation has returned in both cases and the fibroid uterus regained its normal size in the one case, indicating that ovarian function has returned without the disappearance of the virilism. The possibility that these changes may eventually vanish is still present,[3a] but it is significant that with the removal of the masculinizing ovarian tumor, the arrhenoblastoma, the masculine voice persists, indicating that a similar result might be expected, by analogy, with the masculine voice induced by administration of androgenic substances.

Other disagreeable reactions were acne and increase in weight. This tendency to gain weight has been noted frequently in male castrates treated with androgen by Kenyon.[4] This effect was noted in one of our patients in spite of an increase in the basal metabolic rate.

It is true that a certain therapeutic response was obtained. Intractable menorrhagia and dysmenorrhea were controlled in the first case, temporarily at least, by androgenic therapy. Dysmenorrhea associated with a fibroid of the uterus was checked in the second case in that the menses were inhibited. A definite decrease in the size of the fibroid was probably the result of the inhibition of ovarian function by androgen, similar to that noted in monkeys by Zuckerman[5] and in rats by the work of the Mazers[6] and by Freed, Greenhill and Soskin.[7] This explanation is confirmed by the observation in endometrial biopsies that ovulation was prevented in both cases.

It is questionable, however, whether the beneficial results noted in our cases were worth the concomitant undesirable side reactions. Further observations are of course necessary to justify more definite conclusions. At present we are of the opinion that androgenic therapy in women should be approached with caution and is not to be recommended until the danger of virilism can be eliminated or controlled. It is not unlikely that an androgen or similar substance may be developed which will possess the desirable therapeutic effects of testosterone propionate without the harmful virilizing effects.

55 East Washington Street.

3a. In case 2 practically all the symptoms of virilism disappeared about January 10, three months after the last injection of testosterone dipropionate. In case 1 the huskiness and hirsutism are still present, almost four months after the last injection.

4. Kenyon, A. T.: Effect of Testosterone Propionate on the Genitalia, Prostate, Secondary Sex Characters, and Body Weight in Eunuchoidism, Endocrinology **23**: 121 (Aug.) 1938.

CHRONIC ULCER OF THE LEG ASSOCIATED WITH CONGENITAL HEMOLYTIC JAUNDICE

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Since the beginning of the century a considerable literature has accumulated concerning hemolytic jaundice. In 1900 Minkowski and later Chauffard described the congenital type, and between 1907 and 1911 Hayem Widal and his associates presented a group which they considered to be "acquired." Attention was first called to the disease in this country by Tileston and Griffin[1] in 1910. Subsequently the excellent studies of Gänsslen,[2] Eppinger[3] and Meulengracht[4] completed the clinical picture of the disease as it is known today. Dawson[5] and others have presented considerable evidence to show that the acquired and the congenital types are closely related and have cast considerable doubt as to whether any cases that rightfully belong to this group are actually "acquired." Haden's[6] work demonstrated that the spherical microcyte is the fundamental variation from the normal in this disease and that "the anemia, jaundice, splenomegaly, reticulocytosis and increased fragility are all secondary to the globular form of the erythrocyte." An excellent summary of the clinical and laboratory appearances of the disease was given by the Cheneys[7] in 1934.

Aside from the anemia, the commonest complication of the disease is probably gallstones, occurring in 68.6 per cent of the cases reported from the Mayo Clinic.[8] Skeletal defects ("tower skull" of Gänsslen, and the like), joint pains and nosebleeds are also well known associated happenings. In the standard medical textbooks and in a number of the monographs no mention is made of chronic ulceration of the leg as a complication. Gänsslen[2] was one of the first to note this condition and its permanent regression obtained by splenectomy, although he disavows priority in calling attention to it.[9]

5. Zuckerman, Solly: Inhibition of Menstruation and Ovulation by Means of Testosterone Propionate, Lancet **2**: 676 (Sept. 18) 1937.

6. Mazer, Milton, and Mazer, Charles: Effect of Prolonged Testosterone Propionate Administration on the Immature and Adult Female Rat, advance abstract in Endocrinology **23**: 528 (Oct.) 1938.

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2. Gänsslen, M.; Zipperlen, E., and Schüz, E.: Deutsches Arch. f. klin. Med. **146**: 1-46 (Jan.) 1925.

3. Eppinger, Hans: Klin. Wchnschr. **9**: 10 (Jan. 4) 1930.

4. Meulengracht, E.: Der Chronische Hereditaire Hemolytische Ikterus, Leipzig, Klinkhardt, 1922.

5. Dawson, B. E.: Brit. M. J. **1**: 963 (June 6) 1931.

6. Haden, R. L.: Am. J. M. Sc. **188**: 441-449 (Oct.) 1934.

7. Cheney, W. F., and Cheney, Garnett: Am. J. M. Sc. **187**: 191-213 (Feb.) 1934.

8. Pemberton, J. de J.: Ann. Surg. **94**: 755-765 (Oct.) 1931.

9. Gänsslen, M.: Klin. Wchnschr. **9**: 1308 (July 12) 1930.

REPORT OF CASE

The following case is of interest in this respect, and it will be noted that the presence of chronic ulceration of the leg was the patient's presenting symptom.

F. M. H., a woman aged 20, of German-American parentage, an unemployed stenographer, admitted to Vanderbilt Clinic June 29, 1937, complained of a chronic sore on the inner side of the left ankle of twelve months' duration. About one year before she had struck her ankle on a store counter. A bluish spot appeared, and three weeks later a "hole" developed. The lesion was quite painful and interfered with weight bearing but not with motion. She had been treated intermittently at several clinics with ultraviolet rays, boric acid ointment dressings and the like, with little or no progress. Examination of the lesion showed a shallow ulceration 1 by 2.5 cm. just above and posterior to the internal malleolus. There was a moderate amount of yellow slough. A dusky cyanosis surrounded the ulcer for an area of 5 by 6 cm. An area 2 by 3 cm. of this same dusky hue without ulceration was present in a similar location on the right ankle. X-ray examination of the ankle joint was negative. Aerobic and anaerobic cultures yielded only Staphylococcus aureus. The Wassermann reaction was negative. There was no history or clinical condition to suggest tuberculosis. An "elastoplast" bandage was applied, but irritation of the skin was so marked that it could not be tolerated. On her visit July 14 an icteric tint of the sclerae and skin was noted. Abdominal examination revealed the spleen palpable four finger-breadths beneath the left costal margin. Further history revealed that the patient's mother had been "yellow skinned and bruised easily." She was said to have died at 51 from "heart disease." The patient had been at another hospital three years previously because of pain in the left upper quadrant. The enlarged spleen was noted and removal was advised, but the patient refused operation. The patient was admitted to the Presbyterian Hospital July 18. Examination of the blood revealed hemoglobin 60 per cent, red blood cells 3,200,000, white blood cells 7,400, with platelets 317,000, reticulocytes 23.9 per cent, polymorphonuclear leukocytes 58 per cent (0-4-54), eosinophils 5 per cent, basophils 1 per cent, lymphocytes 32 per cent, monocytes 4 per cent, nucleated red cells 1/100, bleeding time two and one-half minutes, clotting time two minutes and forty-five seconds. The red blood cells showed marked anisocytosis

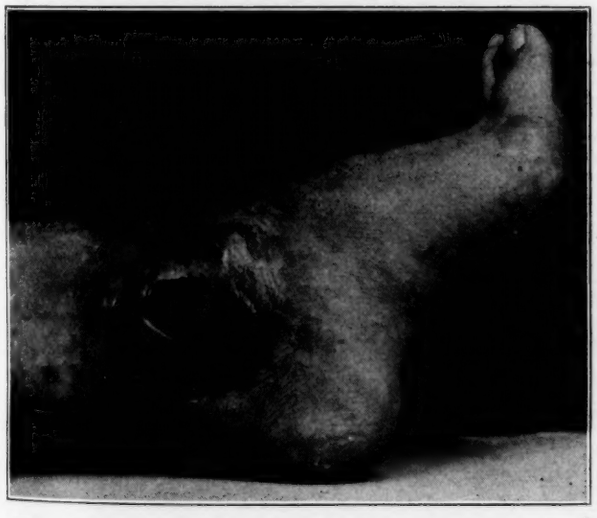

Fig. 1.—The shallow indolent ulcer before operation. Note the surrounding area of dusky cyanosis and pigmentation of the skin.

with a tendency to microcytosis, 19 per cent being the typical spherical microcytes of hemolytic jaundice. Fragility began at 0.625 per cent and was complete at 0.35 per cent. The range of the control was between 0.425 and 0.3 per cent, serum bilirubin 4.4, urine bile 0, urobilin positive. Figure 1 shows the ulcer of the leg July 21 before operation.

Splenectomy was performed by Dr. Louis M. Rousselot July 23. A thin walled gallbladder without stones was noted. The postoperative course was uneventful except for an unexplained elevation of temperature on the third postoperative day. The pathologic examination of the spleen by Dr. V. K. Frantz revealed hemolytic jaundice. The spleen measured 19 by 14 by 8 cm. and weighed 760 Gm. A thin shiny capsule stripped easily. The cut surface was dark red and did not bulge beyond the capsule. The outstanding feature on section was the mass of closely packed red corpuscles throughout the pulp, even infiltrating into the malphigian bodies. The venous sinuses were

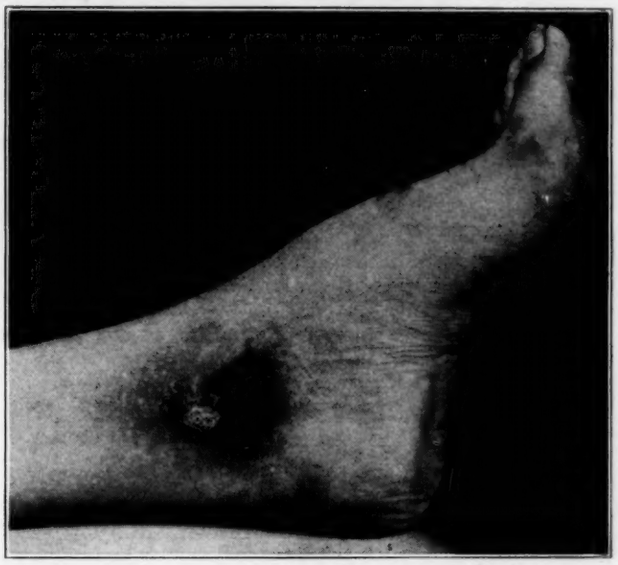

Fig. 2.—The site of the ulcer has remained healed nine months after operation but the pigmentation of the skin is still present.

large. There was no fibrosis. A few hemosiderin-laden phagocytes were noted. These observations correspond to those which Thompson [10] has described as the typical and constant pathologic picture found in the spleen in true hemolytic jaundice.

The patient was discharged sixteen days after operation with the ulcer of the leg healed and with a firm abdominal wound. The blood examination revealed hemoglobin 83 per cent, red blood cells 4,000,000, white blood cells 5,400, platelets 189,000, reticulocytes 0.2 per cent, polymorphonuclear leukocytes 41 (0-1-40) per cent, eosinophils 4 per cent, basophils 2 per cent, lymphocytes 39 per cent, monocytes 4 per cent. The patient was last seen April 30, 1938, nine months after the operation, and stated that she had "never felt better" in her life. The ulcer has remained healed (fig. 2).

COMMENT

This is the first patient with this complication who has been seen in the Spleen Clinic at Presbyterian Hospital, where forty-three patients both with and without splenectomy have been carefully followed for a number of years. Undoubtedly, chronic ulceration of the leg is an infrequent finding in this disease, for Meulengracht in his careful study of thirty-four cases makes no mention of it.

In reviewing the literature at least seventeen similar cases [11] are found and recognition of this complication is made by a number of authors, particularly in Germany and the Scandinavian countries.[12] The large majority of the patients are young women in the second and third decades of life and give a history of having had persistent or recurrent ulceration of the lower leg for from two months to twenty years.

Treatment with ointments, wet dressings and bed rest for as long as two months is only rarely successful, and recurrence is the rule. Three of Eppinger's patients had persistent or

10. Thompson, W. P.: Bull. Johns Hopkins Hosp. **51**: 365-369 (Dec.) 1932.

11. Laux, F. J.: Klin. Wchnschr. **10**: 409 (Feb. 28) 1931. Dudley, G. S.: S. Clin. North America **16**: 839-842 (June) 1936. Smith, G. O.: Chronic Hereditary Hemolytic Jaundice, J. A. M. A. **105**: 1187-1188 (Oct. 12) 1935. Vaughn, Janet M.: The Anemias, ed. 2, New York, Oxford University Press, 1936, p. 232. Gänsslen.[2] Eppinger.[3] Dedichen.[14] Poppe.[15] Seelig and Jaffé.[13]

12. Cowen, S. O.: M. J. Australia **1**: 265 (Feb. 22) 1936; **2**: 545 (Nov. 11) 1922. Eppinger.[3] Dedichen.[14] Poppe.[15] Laux.[11] Cheney and Cheney.[7]

recurring lesions of from seven to twenty years' duration. In a case [13] in which splenectomy was refused, healing was reported after the patient was in bed three months with boric acid ointment dressings, but no follow-up is given.

In the twelve cases in which splenectomy was performed, all the resistant lesions healed in from eight to thirty days. One lesion [14] recurred following direct trauma but healed promptly and showed no evidence of recurrence three and one-half years later.[15] Another [8] had some oozing with each menstrual period for a year and a half after the operation but it finally healed.

Splenectomy in this disease is now a relatively safe procedure. Large series of collected cases show a hospital mortality of but from 3 to 4 per cent.[16]

Even if operation appears to be mandatory during an acute crisis, the mortality is probably not appreciably higher in competent hands.[17]

The ulcers are almost always located in the region of the medial malleolus. There is usually only a single ulcer on the leg, but in about half of the cases there is bilateral involvement. Occasionally multiple ulcers are found in cases of long standing.[14]

Trauma may or may not precede the appearance of the ulcer. Frequently a dusky blue area in the region of the medial malleolus is the first manifestation of the impending ulceration. This breaks down in the center and a shallow indolent erosion appears, which advances to about 3 to 5 cm. in diameter. Larger punched out lesions appear only in the cases of very long standing. There is a moderate amount of yellowish slough. The edges are only slightly elevated and there is little undermining. A ring of the bluish cyanosis or dark pigmentation circumscribes the lesion. There is often considerable pain and, although limitation of motion is unusual, weight bearing may be considerably compromised.

Since Gänsslen's early report there has been considerable speculation as to the nature of the mechanism that causes these lesions to appear and as to why there is prompt permanent remission following splenectomy.

It has been suggested that the ulcers are just another of the congenital defects [2] associated with the disease. This is obviously inadequate, for all the other structural defects remain after clinical cure of the disease is accomplished by splenectomy. The possibility of an effect on the walls of the capillaries secondary to some of the abnormalities found in the chemical analysis of the blood has also been mentioned as predisposing to these ulcers. This seems unlikely, for at no time during the course of the disease can any increased capillary fragility be demonstrated.[18] Similarly, the spherical microcyte itself cannot be considered a causative agent, for it persists following operation long after the lesions have healed.

At present there is no satisfactory explanation of this phenomenon. It is interesting to note that in sickle cell anemia, which has many points of similarity to congenital hemolytic jaundice, three out of four patients reaching adult life have ulceration of the leg.[19] It would seem suggestive then that the causative agent will be found to be a factor common to the two diseases.

SUMMARY

Chronic ulceration of one or both medial malleolar regions occurs as a complication of congenital hemolytic jaundice. The lesions are highly resistant to all local therapy, but splenectomy affords a rapid, permanent cure.

Little recognition is accorded this complication, particularly in this country. It is undoubtedly an infrequent finding but may be the only manifestation of the disease that brings the patient to seek medical aid.

The presence of these ulcers is an added indication for splenectomy if they interfere with the patient's ability to work.

In the presence of apparently unexplained chronic ulceration of the leg, particularly in a young white woman, investigation of the morphology and fragility of the red cells should be made.

630 West 168th Street.

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PRIMARY ADENOCARCINOMA OF THE JEJUNUM WITH PERFORATION

REPORT OF A CASE WITH SOME CLINICOPATHOLOGIC NOTATIONS

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Carcinoma of the jejunum, like carcinoma of the rest of the small intestine, is rare. Acute perforation of such a lesion is still more unusual. Carter [1] in 1935 mentioned that perforation of such a growth with peritonitis was recorded in only one case of laparotomy in the preceding eight years. No doubt he had reference to the case reported by Dencks,[2] which will be described later and which is the only instance of involvement similar to that to be reported that we have been able to find in the literature. The case here reported presented clinically the picture of perforated peptic ulcer.

REPORT OF CASE

History.—J. K., a white man aged 48, a laborer, admitted May 1, 1935, to the Cook County Hospital (surgical service of Dr. John Harger), was seized suddenly with severe pain in the abdomen twenty-two hours before admittance, while doing some repairs on a house. The pain was described as cramplike and more severe in the lower part of the abdomen. It was

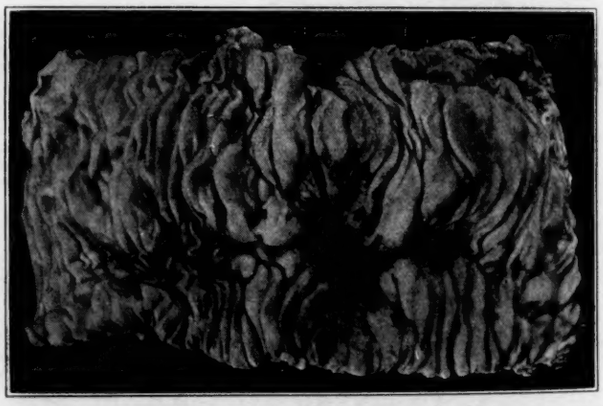

Fig. 1.—Surgical specimen, showing broad perforation in the tumor of the jejunum.

of such intensity that he was forced to lie down immediately. After an hour it ceased and he resumed work. An hour later, however, the pains recurred, increasingly severe and constant. At 5 a. m. (seventeen hours after the onset) a physician advised hospitalization; at this time there was also pain referred to the right shoulder.

The past medical history was entirely irrelevant except for constipation. He took alcohol occasionally. There had been no selective dyspepsia, epigastric distress, loss of weight or vomiting.

On admission the temperature was 100.6 F. rectally, the pulse rate 102, the respiratory rate 36 and the blood pressure 132 systolic and 80 diastolic.

The essential physical pathologic changes were limited to the abdomen and consisted of diffuse boardlike rigidity, slight dis-

Read before the Chicago Pathological Society, Dec. 12, 1938.
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1. Carter, R. Franklin: Carcinoma of the Jejunum, Ann. Surg. **102**: 1019-1028 (Dec.) 1935.
2. Dencks: Carcinoma jejuni mit Perforation, Med. Klin. **23**: 109 (Jan. 21) 1927.

tention and diffuse tenderness. Rebound tenderness was elicited in the left lower quadrant and on auscultation the peristaltic sounds were absent, but there was an occasional metallic click.

Fluoroscopic examination by Dr. R. T. Vaughan revealed free air under the right dome of the diaphragm. Examination of the urine gave negative results; the white blood cell count

Fig. 2.—Section taken near the perforation, under low power, showing invasion of the muscularis by the tumor glands. Hematoxylin and eosin stain.

was 7,800 per cubic millimeter. A preoperative diagnosis of perforated peptic ulcer was made.

Operation and Result.—Operation was performed (by E. A. C.) four hours after admission to the hospital and twenty-six hours after the onset of the initial pain. The abdomen was opened through a right paramedian epigastric incision. The intestinal loops were distended and a considerable amount of bile-stained seropurulent exudate was present. Examination of the stomach, duodenum, gallbladder and appendix, however, revealed no perforation. It was only after following the stream of exudate to its source below the transverse colon and omentum that the perforation was found in the jejunum. The perforation was fully 2 cm. in diameter and occupied the center of a firm constricting mass in this portion of bowel, 18 inches distal to the ligament of Treitz. Intestinal contents were escaping freely. The regional mesenteric lymph glands were enlarged and firm.

A diagnosis of probable carcinoma was made, and a wide resection of this area together with its mesentery was done. The continuity of the bowel was restored by an end to end anastomosis.

Course.—The patient did fairly well until the third postoperative day, when the wound began draining seropurulent material. The abdomen became distended and the peristaltic silence persisted. On the following day, four days after admission to the hospital and five days after onset, the patient died.

Surgical Pathologic Examination (Dr. J. D. Kirshbaum).—Gross: The specimen submitted consisted of a portion of jejunum 14 cm. in length, in the center of which was an ovoid defect measuring 3 by 1.5 cm. involving the entire thickness of the wall. The edges of the defect were firm, irregular and slightly rolled. The serosa was discolored purple-red; the mucosa was purple-tan and edematous (fig. 1).

Microscopic: Sections taken from the region of the tumor revealed a much thickened mucosa, heavily infiltrated with round cells and polymorphonuclear leukocytes. The crypts were lined by tall epithelium and in places were two and three layers thick. Their nuclei were irregular and hyperchromatic, atypical mitotic figures being frequently seen. In places the mucosa was thrown into folds assuming a polypoid appearance. In one area the mucosa was missing and the floor of the defect was formed by the muscularis propria. Beginning at the surface there were dilated and elongated glandlike crypts lined by anaplastic tumor cells. They invaded the entire muscularis propria and extended to the serosa. There was no tendency to production of mucus. In the region of the intact mucosa the tumor glands were seen to extend radially. There were marked thickening in the subserosa distal to the tumor and dense infiltrations of round cells, plasma cells, large mononuclear cells and polymorphonuclear leukocytes (figs. 2 and 3). The diagnosis was adenocarcinoma of the jejunum with ulceration and perforation.

Necropsy.—This was performed six hours after death by Dr. B. Nieman. The essential pathologic observations were restricted to the abdomen. The intestinal loops were markedly distended by gas and were plastered together by loose fibrinous membranes. The serosa was dull and injected; the omentum was adherent to the anterior part of the abdominal wall. Examination of the entero-anastomosis with water revealed no defect in the line of suture. The mesenteric and periaortic lymph glands measured up to 25 mm. in diameter and on sectioning were yellow-gray. The lungs presented areas of focal pneumonia in both lower lobes.

Microscopic Examination of the Periaortic Lymph Node (Dr. Richard Jaffé) (fig. 4): The normal architecture of the lymph node was discernible only at the periphery. The greater portion of it was replaced by nests of glandular epithelium which resembled intestinal mucosa. The glands were round to oval and were lined by cuboidal to columnar cells. Their nuclei were anaplastic, occasional mitotic figures being seen. In between the tumor glands there was a moderate amount of cellular stroma.

The anatomic diagnosis was recent laparotomy wound for resection of a portion of the jejunum, diffuse fibrinoplastic peritonitis, pseudomembranous enteritis, end to end entero-

Fig. 3.—Section under high power showing tumor glands and mitotic figures. Hematoxylin and eosin stain.

anastomosis of the jejunum, metastases of adenocarcinoma to the mesenteric and periaortic lymph nodes and aspiration bronchopneumonia of both lower pulmonary lobes.

COMMENT

We have been able to find only one case of similar involvement in the literature, namely, that reported by Dencks,[2] of a 42 year old man who complained of sudden, severe abdominal pain two hours after the noon meal. A physician administered

morphine. On the following day the patient was admitted to the hospital with symptoms of perforative peritonitis of about ten hours' duration. A laparotomy was performed immediately and a small annular stenosing tumor was found with a perforation at the mesenteric border. A wide resection of this area with an end to end anastomosis was performed and the patient made an uneventful recovery. Histologically the tumor proved to be a cylindric cell carcinoma of glandular type.

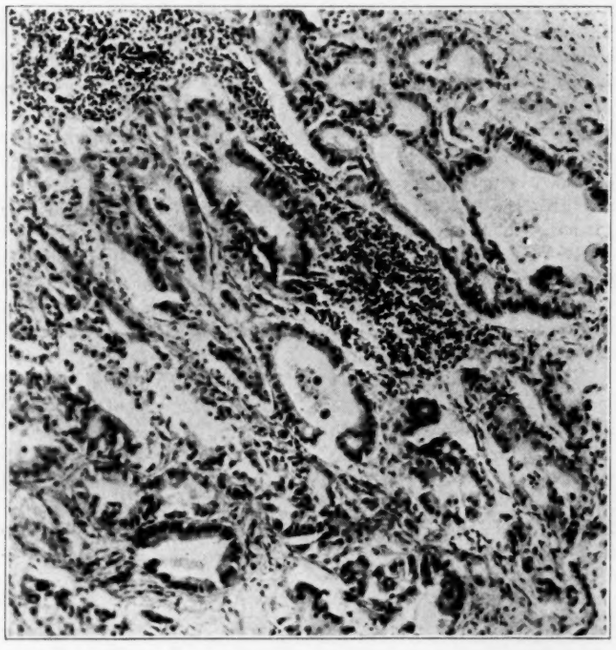

Fig. 4.—Section under low power from one of the periaortic lymph nodes, showing metastasis. Hematoxylin and eosin stain.

Keyser [3] in 1908 reported jejunal carcinoma with fatal perforative peritonitis in a patient in whom a previous exploratory laparotomy had shown an inoperable tumor.

From the statistical study given in the table it will be seen that carcinoma of the small bowel is relatively rare and occurs with least frequency in the jejunum. Because of this rarity there is some discrepancy in the reported incidence of carcinoma of the small intestine from the various clinics. Ewing [4] stated that carcinoma of the small bowel forms 3 per cent of all intestinal carcinomas. Mayo and Nattrour,[5] in reviewing seventy-six cases of carcinoma of the small intestine observed at the Mayo Clinic in the ten years prior to 1936, found that carcinoma of the small bowel comprised 0.62 per cent of all the carcinomas from the cardiac end of the stomach down to and including the rectum, and that carcinoma of the jejunum formed only 0.15 per cent of all the carcinomas of the gastrointestinal tract.

A review of 10,309 necropsies performed at the Cook County Hospital during the nine years from 1929 to 1938 showed seven cases of carcinoma of the small intestine, three of the duodenum and four of the jejunum, compared to 273 cases of carcinoma of the stomach and 163 cases of carcinoma of the colon and rectum—a frequency of 1.6 per cent for carcinoma of the small bowel and 0.9 per cent for jejunal carcinoma among carcinomas of the gastrointestinal tract.

Many theories have been proposed for the relative infrequency of carcinoma of the small intestine, among which may be mentioned the embryonic rest theory of Cohnheim. Other authors have attributed the low incidence to the absence of abrupt bends and irritation such as is seen in the sigmoid colon, the rectum, the hepatic and splenic flexures and the cecum. Carcinoma of the intestinal tract is found at points where there is an abrupt change in the lining epithelium of the canal, e. g. at the junction of the esophagus and the stomach or at the anus and rectum. These abrupt changes are absent in the small intestine. Rankin and Mayo [6] subscribe to the theory that the fluid nature and the alkaline reaction of the contents of the small intestine may explain the lowered incidence of carcinoma of the small bowel.

Whereas the average age in cases of carcinoma of the jejunum was found by Rankin and Mayo [6] to be 47.5 years, this was later revised by Mayo and Nattrour to 51 years. Keyser reported the average age to be 43.9 years. Raiford [7] found 52 as the average age. In four necropsy records of carcinoma of the jejunum from the Cook County Hospital the average age was 47.5 years. The sexes were equally represented.

From a review of the clinical histories in the cases reported, it is apparent that in the majority there were symptoms of acute and chronic intestinal obstruction. Our case differed from these in that the first clinical manifestation was acute perforative peritonitis, which clinically closely resembled that seen in perforation of a peptic ulcer. In an extensive review of the causes of spontaneous pneumoperitoneum by Vaughan and Singer [8] in 1929, two pathologic entities were strongly emphasized, namely perforation of a peptic ulcer and perforation of a gastric carcinoma. Although the lesion in our case was in the jejunum, at the onset it was impossible to differentiate it fluoroscopically from the more frequent perforation of stomach or duodenum. The great rarity of perforation of carcinoma of the jejunum precludes its preoperative diagnosis even in the presence of acute abdominal symptoms if there is no previous history or roentgenologic evidence of a lesion of the small intestine.

The cardinal features in the clinical picture of carcinoma of the small intestine are as a rule those of chronic intestinal obstruction associated with moderate anemia, melena and loss of weight. The absence of these symptoms in our case and the picture of acute perforation of a hollow viscus precluded its preoperative diagnosis.

Whereas in primary carcinoma of the jejunum extensive metastases to the lungs have been recorded by Malerich [9] and to the liver by Milles,[10] in our case they were limited to the radix of the mesentery and the regional lymph nodes.

SUMMARY

A case of primary adenocarcinoma of the jejunum with acute perforative peritonitis was observed in a white man aged 48.

Autopsy Statistics

Years	Source	No. of Autopsies	Carcinoma of: Small Intestine	Jejunum	Ileum	Duodenum	Undetermined Site
1870-1893	Vienna General Hospital*	41,838	17	0	10	7	0
1886-1891	Pathologic Institute of Berne*	5,621	9	0	3	6	0
	Zeman*.....	21,624	9	0	6	3	0
To 1932	Johns Hopkins Hospital [7]	11,500	16	4	3	7	2
1929-1938	Cook County Hospital	10,309	7	4	0	3	0
	Totals.....	90,892	58	8	22	26	2

* Cited by Hermann Nothnagel (Diseases of the Intestines and Peritoneum, in Nothnagel's Encyclopaedia of Practical Medicine, Philadelphia, W. B. Saunders Company, 1904, vol. 8, pp. 402-404).

In a review of 10,309 necropsies performed at the Cook County Hospital four cases of primary carcinoma of the jejunum were found, one of perforation.

3. Keyser, C. R.: Carcinoma of the Jejunum, Lancet **2**: 304-306 (Aug.) 1908.
4. Ewing, James: Neoplastic Diseases: A Treatise on Tumors, ed. 2, Philadelphia, W. B. Saunders Company, 1922, p. 661.
5. Mayo, Charles W., and Nattrour, Walter S.: Carcinoma of the Jejunum, Surg., Gynec. & Obst. **65**: 303-309 (Sept.) 1937.
6. Rankin, Fred W., and Mayo, Charles, Jr.: Carcinoma of the Small Bowel, Surg., Gynec. & Obst. **50**: 939-947 (June) 1930.
7. Raiford, Theodore S.: Tumors of the Small Intestine, Arch. Surg. **25**: 122-177 (July) 1932.
8. Vaughan, Roger T., and Singer, Harry A.: The Value of Radiology in the Diagnosis of Perforated Peptic Ulcer, Surg., Gynec. & Obst. **43**: 593-597 (Nov.) 1929.
9. Malerich, J. A.: Primary Carcinoma of the Jejunum with Metastasis to the Lung: Report of a Case, Proc. Staff Meet., Mayo Clin. **9**: 40-42 (Jan. 17) 1934.
10. Milles, George: Carcinoma of the Jejunum, Tr. Chicago Path. Soc. **13**: 451-452 (June) 1931.

Clinically the picture was that of an acute perforation of a hollow abdominal viscus, as evidenced by sudden abdominal pain, rigidity of the abdomen and the presence of free air beneath the diaphragm.

The condition was clinically indistinguishable from the more common type of perforation, namely perforated peptic ulcer and perforated gastric carcinoma.

In the majority of cases of carcinoma of the jejunum symptoms of intestinal obstruction are associated with melena, moderate anemia and loss of weight. These symptoms were absent in our case.

From a review of the literature it is evident that carcinoma of the jejunum is rare, having an incidence of 0.9 to 0.15 per cent among all the carcinomas of the gastrointestinal tract.

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TUMOR OF THE SPINAL CORD COMPLICATING TABES DORSALIS

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When a patient has a chronic syphilitic condition of the spinal cord and a second and unrelated lesion of the spinal cord develops, the latter may escape detection. The case reported here appears to be the first recorded instance of the diagnosis and successful removal of a glioma of the cauda equina from a patient who had been known to have tabes for some years.

REPORT OF CASE

A married man, aged 48, was referred to the Mayo Clinic in January 1938 with a diagnosis of tabes dorsalis. In 1905 he had had a chancre and had received inunctions of mercury. In 1920, when he had complained of headaches and diplopia, a physician had discovered that deep reflexes of the lower extremities were absent and that Argyll Robertson pupils were present. The Wassermann reaction of the blood was positive. Eighteen injections of neoarsphenamine reversed this reaction. Several years later, typical tabetic lancinating and spot pains had appeared in the lower extremities and had continued to occur in spells several times each month until 1937; in that year none had been experienced

Gradual decrease in both libido and potentia had begun in 1930 and both had been absent by 1933. In 1936 the patient had noted absence of the normal sensation of fulness of the bladder and difficulty in emptying it. With time, rectal function had become similarly impaired. In May 1936 spinal puncture had been performed. The cerebrospinal fluid obtained was xanthochromic and contained an excess of protein and 10 cells per cubic millimeter. Intensive therapy with neoarsphenamine, bismuth compounds and tryparsamide was begun. However, the patient's symptoms had progressed, weakness and incoordination of the lower extremities becoming the most distressing symptoms. The patient finally had been reduced to getting about with a cane and had been forced to resign his employment. Spinal puncture again revealed a yellow fluid and led to the patient's being sent to the clinic.

The pupils were small, unequal and irregular. They reacted in accommodation but not to light (Argyll Robertson pupil). Power of the hamstring muscles of both thighs was reduced and that of the muscles of both legs and feet was markedly impaired. Deep reflexes of the upper extremities were normal but those of the lower extremities were absent. Abdominal reflexes could not be obtained. Signs indicative of injury to the pyramidal tract were not elicited. Romberg's test gave a positive result. The anal sphincter was atonic.

Sensibility to painful stimuli was markedly diminished over the whole of both lower extremities and, to a less extent, in a patchy fashion over the trunk. Testicular pressure was not painful. An exact "sensory level" could not be demonstrated. Sensibility to touch and temperature were only slightly impaired. Vibratory sense was well preserved but joint sense was seriously impaired in both feet. Tests of coordination were poorly performed with the lower extremities and the patient exhibited a steppage type of gait.

Routine laboratory tests of blood and urine all gave results within normal limits. Roentgenograms of the thorax and of the entire spinal column disclosed no abnormality aside from a narrow lumbosacral joint space. On spinal puncture, however, fluid could not be obtained at the third lumbar interspace; that is, at the interspace below the third lumbar vertebra. At the fourth lumbar interspace a deeply xanthochromic fluid was obtained, in which a pellicle formed spontaneously. The fluid contained 4,000 mg. of total protein per hundred cubic centimeters and 3 small lymphocytes per cubic millimeter; the result of the Nonne test was strongly positive and the Kolmer-Wassermann and Kline tests gave negative results. The Queckenstedt test (bilateral jugular compression) demonstrated almost complete block in the spinal subarachnoid space above the fourth lumbar interspace. In order to localize the obstructing lesion further, additional spinal punctures were performed at successively higher levels. At the twelfth thoracic interspace, fluid could not be obtained. However, at the tenth thoracic level the spinal fluid was only faintly yellow and the Queckenstedt test gave no evidence of block.

Because it was believed that the obstruction probably was caused by a benign neoplasm involving the spinal cord and that it was not of syphilitic etiology, laminectomy was performed by one of us (J. G. L.) Feb. 7, 1938. When the laminae of the third lumbar vertebra were removed, the underlying dura mater was found not to pulsate. The dura mater was opened, exposing a tumor which appeared to fill the caudal dural sac. The laminectomy was extended in both directions until the entire mass could be seen. It extended from the lower border of the twelfth thoracic vertebra to the fourth lumbar vertebra. It was possible to remove the tumor in one piece after severing its connection with the filum terminale below and the conus medullaris above. It appeared to have taken origin from the tip of the conus and it was necessary to sacrifice the distal segment of the conus in removing the tumor. Once the tumor had been removed the fibers of the cauda equina came into view, as they had been displaced anteriorly. On microscopic study Dr. J. W. Kernohan identified the tumor as an ependymoma.

The patient left the hospital on the seventeenth postoperative day, at which time sensation and power in his lower extremities had improved; catheterization was still necessary. Three months after operation the patient reported that his gait was normal and that his legs were of normal strength. He no longer noted sensory impairment of his feet. It was still necessary at times for him to catheterize himself.

COMMENT

To determine when the tumor first produced symptoms is difficult. Probably the alterations in sexual and sphincteric function which began in 1930 were results of growth of the tumor, although the syphilitic lesion may have played some role in their production. Although pain in the lower part of the back and in the distribution of the sciatic nerves almost always is present in cases of tumor of the cauda equina, and is the initial symptom in 80 per cent of cases,[1] such pain was absent in this case, probably because of the preexisting tabetic lesions of the sensory conducting pathways of the spinal cord. The lancinating and spot pains which the patient had experienced for a number of years were typical of tabes and did not suggest the root pains of a spinal cord tumor. Furthermore, these pains had been absent during the year before the patient came to the clinic.

The physical and neurologic examinations gave rather typical signs of advanced tabes dorsalis except that the muscular weakness of the lower extremities was greater than might be attributed to the hypotonia and ataxia of tabes dorsalis. Muscular weakness per se is rarely a prominent symptom of tabes dorsalis.

From the Section on Neurosurgery, the Mayo Clinic.

1. Kernohan, J. W.; Woltman, H. W., and Adson, A. W.: Gliomas Arising from the Region of the Cauda Equina: Clinical, Surgical and Histologic Considerations, Arch. Neurol. & Psychiat. **29**: 287-305 (Feb.) 1933.

The first real suspicion of the presence of a complicating lesion arose when lumbar puncture disclosed complete block of the spinal subarachnoid space and a deeply xanthochromic cerebrospinal fluid. The protein content was unusually high (4,000 mg.). The cell count of the fluid was normal and serologic tests gave negative results.

Such conditions do not occur in uncomplicated tabes dorsalis. Xanthochromic cerebrospinal fluid had been recorded in a variety of syphilitic lesions of the spinal cord, such as acute syphilitic meningitis, thrombosis of the spinal arteries and syphilitic meningomyelitis.[2] However, in none of these is the protein content excessive nor is subarachnoid block present. There is another group of syphilitic lesions of the spinal cord, however, in which the classic Froin syndrome may occur, namely a xanthochromic fluid which contains an excess of globulin and lymphocytes and which clots spontaneously on standing. Such lesions are pachymeningitis hypertrophica, chronic syphilitic leptomeningitis and gumma of the spinal meninges or cord. Recently these have been grouped together as "syphilitic pseudo tumors" by Haguenau and Lichtwitz,[3] who emphasized that pleocytosis of some degree is a constant finding in these cases and that the spinal fluid nearly always gives a positive Wassermann reaction. Thus the cerebrospinal fluid in our case was not typical of any definite syphilitic syndrome but, rather, was typical of a neoplasm of the spinal cord, producing complete obstruction of the spinal subarachnoid space.

Furthermore, our inability to obtain cerebrospinal fluid at the third lumbar interspace suggested that a local rather than a diffuse obstructing lesion was present and prompted the use of multiple punctures[4] by means of which the extent of the lesion was determined. This method not only gave more information than would injection of a radiopaque oil below or above the lesion but it also avoided any possible aggravation of an inflammatory process.

TORSION OF THE GALLBLADDER

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Torsion of the gallbladder is such a rare condition that of the few cases reported only four occurred in this country. Shipley,[1] in a thorough search of the literature, was able to find twenty-one cases, most of which were reported in the English and German literature.

Before reporting these cases I shall state briefly the five possible anatomic arrangements and positions of the gallbladder:

1. The gallbladder may be embedded in the liver tissue.

2. It may be closely attached to the under surface of the liver with no intervening layer of connective tissue.

3. The outer end of the fundus may be surrounded by peritoneum and the rest attached to the liver, but not actually touching it, because of an interposed layer of fibrous tissue. This is the normal anatomic arrangement.

4. The gallbladder may be completely surrounded by peritoneum and lie free in the abdomen except for its attachment to the cystic duct. This is not a common occurrence. If it were not for the unfortunate ease with which these gallbladders become twisted, this anatomic arrangement would be generally accepted as an ideal one from the point of view of the surgeon. All that is necessary in doing a cholecystectomy on such a gallbladder is to ligate the cystic artery and the cystic duct and remove the organ.

5. The gallbladder may be completely surrounded with peritoneum and attached to the liver by a mesentery.

The cases I am reporting here illustrate the last two groups:

CASE 1.—An unmarried woman aged 54, while riding over an unusually rough road August 31, was suddenly seized with excruciating pain in the upper right quadrant. The pain at first localized in the region of the ninth costal cartilage and later became more or less generalized over the entire right side. The pain was soon followed by nausea and vomiting. These three symptoms, being the only ones she presented, became worse until the time of operation September 1, thirty-six hours after their first appearance. She was seen three hours after the onset by her family physician, who made a diagnosis of indigestion and gave her one-fourth grain (0.016 Gm.) of morphine sulfate with no relief of pain. When I saw her thirty hours later she appeared to be very sick and in acute pain. The temperature was 100 F. by mouth and the pulse rate was 95.

Her past history was entirely negative except for constipation and belching of gas. Physical examination revealed that the patient was poorly nourished with scoliosis, the concavity of which pointed to the right side. This deformity brought the right costal cartilage unusually near the crest of the ilium. There was no jaundice. Examination of the head, neck, eyes, mouth, throat, heart and lungs gave essentially negative results, except for the fact that her respirations were almost entirely thoracic and that the abdomen did not move, even on deep inspiration. The abdomen was not distended and there was no visible peristalsis. Palpation of the abdomen failed to reveal any palpable masses but did reveal a very definite rigidity of the entire right side with a maximum point of tenderness just to the right of the umbilicus. This point later proved to be the location of the gallbladder. A diagnosis of either acute cholecystitis or acute appendicitis was made, and the patient was taken to the hospital for operation. The blood count revealed 20,500 leukocytes with 80 per cent polymorphonuclears. The urine was normal except for a trace of albumin with a few pus cells.

On opening the peritoneal cavity I found no trace of free fluid, which is often present in these cases. The gallbladder was first examined and found to be lying a short distance from the under surface of the liver with the fundus pointing downward and backward. The entire organ was completely surrounded with peritoneum. It was tense and its walls were a reddish brown. It was twisted one and one-half times from left to right and, when untwisted, emptied freely. The cystic duct had a short mesenteric attachment to the liver in which lay the blood vessels. Thus the cystic duct acted as a central point about which the gallbladder could rotate at will. A cholecystectomy was performed by ligating the cystic artery and cystic duct and removing the gallbladder. The appendix was next visualized and its vessels were injected. The lumen contained two fecaliths. An appendectomy was performed and the abdomen closed in layers. Recovery was uneventful except for the fact that a stitch abscess developed on the tenth day.

The pathologic examination revealed the gallbladder 8 by 4.5 cm. in diameter, reddish brown and filled with thick, dark brown fluid. The mucous membrane was swollen and congested. There were no calculi. The wall of the gallbladder contained several small hemorrhagic areas.

CASE 2.—An Italian woman, aged 23, married, came to St. Luke's dispensary with a history of attacks of pain in the epigastrium. The pain was colicky and radiated through to the right shoulder. This was followed by nausea and vomiting. She had had several such attacks in the last four years. Her past history was otherwise irrelevant. A roentgenogram showed a nonfunctioning gallbladder. She was admitted to the surgical service and a cholecystectomy was done. The gallbladder was completely surrounded with peritoneum and attached to the under surface of the liver by a mesentery. It contained several small stones. A cholecystectomy was done by simply clamping and ligating the mesentery and likewise the cystic duct.

This case represents the fifth anatomic group.

From a clinical point of view there are two types of torsion of the gallbladder, namely complete and incomplete. In complete torsion there is strangulation of the blood supply and gangrene of the gallbladder. The symptoms are acute, beginning with dramatic suddenness. In incomplete torsion there is interference with drainage of the gallbladder. The symptoms are insidious in onset and resemble those of chronic cholecystitis.

It was interesting to note that nineteen of the twenty-one cases reported occurred in women, all but two over 50 years of age and the majority over 70. Gallstones were present in only six instances. The direction of the volvulus is not a matter of significance, since seven were clockwise, five were

2. Merritt, H. H., and Fremont-Smith, Frank: The Cerebrospinal Fluid, Philadelphia, W. B. Saunders Company, 1937.

3. Haguenau, J., and Lichtwitz, A.: La syphilis pseudo-tumorale de la moelle, Ann. de méd. **27**: 268-288 (March) 1930.

4. Elsberg, C. A., and Cramer, Fritz: Multiple Spinal Punctures: Their Value for Localization and Diagnosis of Tumor of Cauda Equina, Arch. Neurol. & Psychiat. **23**: 775-783 (April) 1930.

From the Surgical Service of St. Luke's Hospital.

1. Shipley, A. M.: Torsion of the Gallbladder, Arch. Surg. **14**: 968 (May) 1927.

counterclockwise and the direction of the rest was not mentioned. Three patients died; a fourth case was discovered at autopsy. It was discovered in one case that the common duct was evidently drawn up by the twisting of the cystic duct and ligated. This patient became deeply jaundiced and died twelve days later. Only one case was diagnosed properly; the other cases were diagnosed practically everything concerned with the abdomen from indigestion, as in this case, to twisted ovarian cyst, cholecystitis being the most frequent diagnosis.

In the majority of cases the onset was very sudden and in only one case was there a previous history of discomfort in the upper quadrant of the abdomen. The clinical picture is so definite that, according to Lett,[2] pain in the upper right quadrant of the abdomen beginning with dramatic suddenness, followed by nausea and vomiting, with very slight elevation of temperature, a moderate increase in the pulse rate, occurring with or without a palpable mass in a woman over 65 with no previous history of gallstones, should always make one suspicious of torsion of the gallbladder. However, the condition is so very uncommon that its likelihood of being present is usually not considered.

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Special Articles

THE PHARMACOPEIA AND THE PHYSICIAN

IMMUNOLOGIC METHODS IN PEDIATRICS

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This is one of the second series of articles written by eminent authorities for the purpose of extending information concerning the official medicines. The twenty-four articles in this series have been planned and developed through the cooperation of the U. S. Pharmacopeial Committee of Revision and THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION.—ED.

Susceptibility of the individual is a necessary factor when considering the application of an immunizing agent. In many instances age exerts a controlling influence on susceptibility. It is well known that smallpox, erysipelas, whooping cough and chickenpox may occur in very early infancy. Any of these diseases may be encountered during the first few weeks of life; smallpox and erysipelas may develop soon after birth. Various forms of meningitis also occur very early. Diphtheria and scarlet fever are not common before 1 year of age and are rare under 6 months; the same holds true for poliomyelitis. Measles is very infrequent prior to the first half year of life.

PROCEDURES FOR ACTIVE IMMUNITY AGAINST SOME OF THE MORE COMMON INFECTIOUS DISEASES

In view of the foregoing facts, vaccination against smallpox should be the first protective measure to be adopted in the life of the child to afford artificial immunity. If the infant is in good health and without any cutaneous disorder such as eczema, from the third to the fourth month offers a good time for this procedure. In the presence of known exposure to smallpox there is no contraindication to vaccination. If possible it is preferable to choose cool weather for the inoculation, when there is less likelihood of secondary infection. The multiple pressure method is superior to all others. Failure to secure a successful vaccination in an unvaccinated individual should never be construed as an indication of immunity. This statement is based on the assumption that the patient has not had smallpox.

Next in order, immunization against whooping cough may be undertaken. For this purpose Sauer's vaccine is injected subcutaneously. It is given at weekly intervals, two injections each time in doses of 1 cc., 1.5 cc. and 1.5 cc., making a total of 8 cc. or about 80 billion bacteria. It requires about four months for immunity to develop. Therefore if inoculations are made at 3 months of age the baby cannot be assumed to have protection from whooping cough before it is 7 months old.

Diphtheria immunization can be instituted at 9 months. This is best accomplished by the subcutaneous injection of three doses of toxoid or two doses of alum precipitated toxoid. In either instance the dose is 1 cc. with an interval of from three to four weeks between injections. In many cities of the United States only one dose of alum precipitated toxoid is employed. It is presumed that the antigenic response is sustained over a more prolonged period with the latter preparation than when plain toxoid is used. However, although immunity with alum precipitated toxoid may be established within two months, it does not last for more than two years in about 50 per cent of cases. It is well to perform a Schick test six months after administration of toxoid to determine its success.

Ramon, who introduced toxoid for diphtheria immunization, now strongly recommends that tetanus toxoid be administered in combination with the diphtheria toxoid. His method consists of injecting subcutaneously 2 cc. of the combined toxoids on three occasions at intervals of three weeks. This plan seems very desirable and will undoubtedly be given wider acceptance in the future.

The Dick method for active immunization against scarlet fever has not received the general approval of pediatricians. Fear of severe reactions, the multiplicity (five) of injections and the belief that immunity to hemolytic streptococcus infections is not assured deter many from adopting the method. Nevertheless in hospitals and institutions where large numbers of children are housed the procedure is of undoubted value. Robinson [1] has reported favorable results with intracutaneous injections of scarlet fever toxin. In this manner less toxin is used, fewer (three) injections are made and reactions are avoided. Lately Earle [2] of Desplaines, Ill., has used this plan successfully. Previously others had reported the intradermal method for active immunization against anthrax, typhoid and diphtheria.

Immune globulin (placental extract) may be injected intramuscularly with the object either of preventing or of modifying measles. If the intention is to prevent measles, 2 cc. should be injected within forty-eight hours of exposure and the same size dose repeated about five days later. For modification 2 cc. of the immune globulin is injected usually from five to seven days after exposure. It must be remembered that the method for prevention constitutes only a temporary immunity. On the other hand, modification of the disease results in the same degree of immunity as occurs after an unmodified attack of measles. Modified measles, however, can be transmitted to those who are susceptible, and these may suffer from severe attacks. For this reason the method for modification is not suitable, as a rule, in hospitals or institutions where the necessary aim is generally prevention.

Active immunization against typhoid is a thoroughly reliable procedure. Typhoid vaccine usually contains

2. Lett, Hugh: Two Unusual Conditions of Gallbladder: One a Case of Torsion, Lancet **1**: 99 (April) 1909.

1. Robinson, J. H.: J. Immunol. **31**: 373 (Nov.) 1936.
2. Deceased.

about one billion bacillus typhosus organisms per cubic centimeter. Combined with this about 750 thousand each of paratyphosus A and B are frequently used. The vaccine is administered subcutaneously in three doses of 1 cc. each at seven to ten day intervals. The point of injection is usually over the deltoid muscle. Protection generally lasts for about three years.

METHODS FOR PASSIVE IMMUNITY AND TREATMENT

Animal and human antiserums are valuable therapeutic aids in certain acute infectious diseases. Their efficiency has been firmly established for both prophylactic purposes and treatment of acute conditions.

Diphtheria antitoxin is the best example of a thoroughly efficient animal serum for the treatment of disease. Antitoxins for tetanus, scarlet fever, meningococcic infections, staphylococcic infections, gas bacillus and erysipelas are among the better known. All of these are produced in the horse. Tetanus antitoxin is sometimes developed in the cow as well. Bovine tetanus antitoxin may be used for man when known sensitivity to horse serum exists. Antipneumococcus horse serum, which was first available for pneumonia of types I and II, is now produced also in the rabbit. The field of usefulness for antipneumococcic serum is being rapidly expanded by the production of antiserums for a number of the other types, including III, IV, V, VI, VII, VIII and XIV.

PROPHYLACTIC DOSAGE

Estimation of the proper dose for any one of the antiserums is sometimes a difficult problem. There is no standard rule or method which is always satisfactory. For diphtheria prophylaxis, when immediate protection is desired for a susceptible contact, it is a common practice to administer 1,000 units of diphtheria antitoxin. This quantity is injected intramuscularly. Since the protection afforded is a passive immunity it is not enduring and usually does not last for more than from ten days to three weeks, the antitoxin being rapidly eliminated. For passive immunity to tetanus the dose is generally 1,500 units, though sometimes because of the nature of an injury or on account of delayed administration double that quantity is injected and occasionally for special reasons the dose should be repeated in five days. Needless to state, the antiserum should be given at the earliest possible moment.

DOSAGE OF ANTISERUMS FOR ACUTE STAGE

I have referred to the fact that there is no satisfactory method for determining accurately the dose of an antiserum which is applicable to all patients. Nevertheless a mathematical means for gaging the dose of diphtheria antitoxin was offered many years ago. It was stated that 100 units per kilogram of body weight was sufficient for a mild or average attack of diphtheria and that 500 units per kilogram sufficed for severe diphtheria. In practice this mathematical method is not satisfactory. It seems much more important to base the dose on the site of infection and the duration of the disease. In postnasal or nasopharyngeal diphtheria the rate of absorption of toxin is much more rapid than when the diphtheria membrane is confined to the tonsils. Consequently the dose of antitoxin should be greater in the former condition. Likewise the longer the patient has been ill without antitoxin administration, the greater is the quantity of toxin produced and therefore the larger is the amount of antitoxin required. However, since toxin combines with the body tissues and is not then readily vulnerable by the antitoxin, it is principally the free toxin which can be neutralized or rendered inert by antitoxin. This makes the necessity for early administration of antitoxin apparent and explains why diphtheria antitoxin is not of value in the treatment of postdiphtheritic paralysis.

One's own experience must serve in a large measure as a guide in deciding how much antiserum shall be used for any given patient. In an experience of more than twenty-five years in contagious disease hospitals I have found that diphtheria antitoxin in excess of 60,000 units is seldom if ever beneficial. In most instances our total dose is not more than 40,000 units. Having decided on the maximum amount of antitoxin that seems necessary it is best for one to give the total quantity at once and not in divided doses. If it is later believed that an error in judgment occurred regarding the size of the dose, an additional amount should be injected. The administration of diphtheria antitoxin does not constitute the sum total of all treatment. It is the primary and most important part of treatment except in certain types of laryngeal or laryngotracheal diphtheria in which surgical intervention is even of greater necessity than antitoxin. A discussion of intravenous dextrose as an adjuvant in the treatment of diphtheria is not within the province of this article.

Tetanus antitoxin presents even more difficult problems for solution in respect to dosage than does diphtheria antitoxin. Again experience must be the judge. Lately the tendency to give extremely massive doses of tetanus antitoxins has not been so apparent in some sections of the United States. Increasing dependence seems to be placed on sedation, some believing from 60,000 to 100,000 units of tetanus antitoxin sufficient for any tetanus patient whose recovery is possible.

What has been said with regard to diphtheria and tetanus antitoxin dosage also applies to the use of scarlet fever antitoxin and any of the other immune serums whether they are antitoxic or antibacterial products. Early administration is of great importance. The age of the patient is not as essential a factor in deciding on dosage as virulence of the organisms, susceptibility of the patient, duration of the disease and in some instances the site of the infection. Nothing, however, is so helpful as one's own experience.

ROUTES FOR INJECTION

Most antiserums have been given by one of three routes: (1) subcutaneous, (2) intramuscular or (3) intravenous. Originally the subcutaneous method of injecting antiserums was the most common. Today it is the least used. The intramuscular route is the one most often employed. Absorption is much more rapid and there is less pain when the antiserums are properly administered; it is also a reasonably safe procedure which can be adopted in the home as well as in the hospital.

During recent years particularly, intravenous therapy has been broadly extended. This route was strongly advocated by some for the administration of diphtheria antitoxin more than twenty years ago. The method is not recommended for patients confined in the home. From time to time it is selected for hospitalized diphtheria patients. It is doubtful whether the administration of diphtheria antitoxin intravenously will save a patient who would not recover by means of intramuscular treatment. On the other hand there is an increased tendency, as previously mentioned, to use the intravenous route for immune serums.

In the contagious disease hospitals of Chicago all antimeningococcus serum and meningococcus antitoxin are given by the intravenous route. Nothing is introduced intraspinally when treating patients with meningococcic infections whether there is evidence of meningitis or not. This change in method of treatment was made by us in 1934, before the introduction of sulfanilamide, and has produced excellent results. The belief that tetanus antitoxin should be given intraspinally is no longer universally accepted. It is my opinion that the treatment of tetanus without intraspinal therapy is advisable. In any form of blood stream infection, intravenous administration of an antiserum seems logical. In this connection outstanding examples are septicemias due to the meningococcus, streptococcus and staphylococcus.

In the past, antiserums have been administered in practically every conceivable manner. In addition to those routes mentioned are the intracisternal, intraperitoneal, intrapleural and also oral and rectal. Today the intramuscular and intravenous routes are the methods of choice.

Regardless of the route chosen, serum should not be injected when cold. Under such a condition it is likely to cause severe pain if injected in the muscle and will be absorbed slowly. If cold antiserum is given intrathecally or intravenously, it may cause serious shock. The serum should be at body temperature before administration regardless of the route chosen. But a temperature much above 98 F. may lessen or destroy the potency of serum and even cause coagulation.

INTRAVENOUS ADMINISTRATION OF SERUMS

Any animal antiserum when given intravenously is best diluted in physiologic solution of sodium chloride or in from 5 to 10 per cent dextrose in saline solution. The diluent should be of at least equal volume to the serum; it may be more than double the volume. To the mixture we add from 5 to 15 minims (0.3 to 1 cc.) of solution of epinephrine hydrochloride (1:1,000) depending on the age of the patient. The drip method should be selected and the flow at body temperature ought not exceed from 10 to 15 drops a minute at first. Later if the patient shows no unfavorable symptoms the rate of flow can be increased often to 60 drops a minute. With this method I have given as much as 1,200 cc. of horse serum (meningococcus antitoxin) to a patient within four days' time without any disturbing symptoms being noted.

SERUM SICKNESS

Fear of serum reactions has existed in the minds of physicians since the early adoption of biologic products for therapeutic purposes. While it is well known that serum reactions have been of common occurrence in connection with the administration of animal serums, the possibility of fatal consequences often has been magnified greatly during past years. Among 20,000 diphtheria patients treated in the Municipal Contagious Disease Hospital, Chicago, from 1917 to 1938, no anaphylactic death has occurred. Nor has it ever been customary to make routine sensitivity tests in that institution.

With the improved methods for concentration and refinement of animal antiserums which are in use today there is less reason than ever before to anticipate a high frequency of protein shock as a result of serum administration. Nevertheless it must be realized that serum reactions do occur and proper means should be adopted in an endeavor to prevent or minimize them.

If a patient is known to be sensitive to horse serum it may be possible to avoid the use of serum of that animal. This can be done in the case of tetanus by giving bovine tetanus antitoxin. If horse serum must be used for an asthmatic patient or some one who is known to have been treated with a horse serum on some previous occasion, it is well to make a sensitivity test and, if positive, to attempt desensitization by the usual graduated injections of small amounts of the serum. Although this is a worthy procedure, its actual value sometimes seems doubtful.

The usual form of serum sickness manifests itself in from eight days to two weeks following injection. If the serum was given intravenously the reaction generally occurs earlier, often in from six to ten days. The symptoms presented include some or all of the following: elevation of temperature, urticarial eruption, painful joints and lymphadenitis. It is worthy of note that serum sickness of this type when developing in patients with meningococcic meningitis may be accompanied by an increase in cell count and spinal fluid pressure.

Treatment consists of solution of epinephrine hydrochloride (1:1,000) from 0.3 to 0.5 cc. subcutaneously, intramuscularly or intravenously, depending on the degree of reaction. Free catharsis and local application of calamine lotion to relieve itching is helpful. In my experience the administration of calcium gluconate intravenously has not been of marked value. Nevertheless it is sometimes deserving of trial.

Accelerated or immediate reactions may develop in persons who have been treated previously with horse serum. Such reactions may occur within a few hours following serum administration or during the progress of intravenous serum injection. Reactions of this kind are not necessarily more severe than those previously described as the usual form.

ANAPHYLACTIC SHOCK

The most severe of all serum reactions may develop almost at the instant the serum is injected or follow within a period of about one hour. The severity of the reaction does not always seem to depend either on the amount of serum given or on the route selected. Sometimes there is a convulsion, the pulse rate becomes very rapid and is thready in character, cyanosis may develop, respirations are accelerated and shallow, profuse sweating occurs and death takes place. Pulmonary edema is usually present under such circumstances. Should acute anaphylactic shock occur, solutions of epinephrine hydrochloride (1:1,000) from 0.5 to 1 cc. should be administered at once. If the serum was administered in an extremity, a tourniquet should be applied proximally to the site of injection.

ARTHUS PHENOMENON

The Arthus phenomenon is a local tissue reaction and is occasionally seen when a second injection of animal serum is made near the site of a former injection. It is never likely to occur if the second injection is made within five days' time. It is characterized by swelling and marked induration, which may involve both the subcutaneous and the muscular tissues. As a rule the reaction does not develop rapidly but may result in a marked sloughing of tissue. There may be considerable pain in the part involved, which generally is better relieved by cold compresses than by hot applications. To avoid the possibilities of an Arthus phenomenon it is well never to make a second subcutaneous or intramuscular injection of serum near a prior one.

HUMAN IMMUNE SERUM

Sometimes it is asserted that human convalescent serum should be of particular value in the prevention or treatment of virus diseases. Practical experience does not indicate that such a contention is always true. Whereas it is a fact that the serum of convalescent patients is of great value in the prevention of measles and to some extent as a prophylactic for chickenpox when given early enough, it is generally believed that convalescent poliomyelitis serum is worthless for preventive purposes; nor is there sufficient evidence to uphold an opinion that human convalescent serum is of value for the treatment of any of these diseases. Convalescent serum has also been used for the prevention of mumps and whooping cough and for the treatment of a number of nonviral diseases including scarlet fever, meningococcic meningitis and erysipelas. The folly of administering convalescent serum for the last named disease should be apparent when one considers that the average erysipelas patient acquires practically no immunity from an attack of the disease. Consequently there is no basis for anticipating that the blood or serum of a convalescent erysipelas patient will contain sufficient antibodies to be of therapeutic value.

MEASLES CONVALESCENT SERUM

Human convalescent measles serum is of undoubted value for prevention when administered within three days of exposure. The dose, injected in the outer muscles of the thigh, varies from 5 to 10 cc. according to the patient's age. Protection is only temporary, usually from ten days to three weeks. When convalescent measles serum is administered more than three days after the exposure of the susceptible person, it is likely to modify the disease even if it does not prevent it.

Normal adult serum or whole blood is also used for passive immunization against measles. In either case the quantity injected should be greater than if convalescent serum were being used. For normal serum the dose is generally from 10 to 20 cc., while for whole blood as much as 30 cc. is required.

Human convalescent serum for chickenpox, mumps and whooping cough has been employed in a manner similar to the measles serum but not with the same degree of success. Convalescent scarlet fever serum is of value as a prophylactic.

Of all human immune serums to be used, convalescent scarlet fever serum seems to be by far the most efficient. Nevertheless it has been claimed that human convalescent scarlet fever serum is only one thirtieth as potent as scarlet fever antitoxin. The latter conclusion seems doubtful from observations made on the treatment of several thousand cases of scarlet fever with human convalescent serum. Possibly human immune scarlet fever serum possesses some therapeutic properties which cannot be measured by ordinary laboratory methods.

The advantage of immune human antiserums of known efficiency over animal serums is the absence of serum reactions. For this reason repeated doses regardless of time intervals may be injected without fear of serum sickness. Moreover, serum may be given in large quantities, if need be, by the intravenous route without unpleasant effects and without the necessity of dilution. When administering human antiserums intravenously it is needless to say that no typing or matching of blood is required. For a number of years practically all human convalescent scarlet fever serum used in the contagious disease hospitals in Chicago has been injected by the intravenous route. The dosage generally varies from 20 to 100 cc., depending on the severity of the case.

Immunotransfusion in the treatment of acute infectious diseases is sometimes adopted as a last resort when the prognosis seems to be particularly desperate. Selection of the donor involves the necessary typing of blood, and the success of the undertaking is influenced by the antibody content of the source of the blood. The transfusion in itself, however, may be of great benefit regardless of any immunizing substances transferred by the operation.

LYOPHILE

Lyophile, dried human blood serum, offers great possibilities. It is prepared by freezing at low temperatures and rapid dehydration under high vacuum. Lyophile can be preserved for long periods in sealed ampules and antibody properties retained. For use it is merely dissolved in sterile distilled water. Convalescent serums have been subjected to this process and the lyophile injected for therapeutic purposes. Bond and Wright at the University of Pennsylvania have reported on the intravenous injection of lyophile following shock or hemorrhage.

Eventually sulfanilamide may displace, to a considerable extent, some of the biologic preparations now in common use. This new drug is particularly effective in erysipelas and streptococcic meningitis. It is also of undoubted value in meningococcic meningitis. But its value in scarlet fever seems very questionable on the basis of personal observations.

CONFERENCES ON THERAPY

TREATMENT OF INFECTIONS OF THE GENITO-URINARY TRACT

NOTE.—*These are actual reports, slightly edited, of conferences by the members of the Departments of Pharmacology and of Medicine of Cornell University Medical College and the New York Hospital, with the collaboration of other departments. The questions and discussions involve participation by members of the staff of the college and hospital, students and visitors.*

DR. MCKEEN CATTELL: Our subject this morning, "The Treatment of Infections of the Genito-Urinary Tract," is one in which there has been a considerable advance in the past few years, an advance which has included the introduction of a number of new drugs. Dr. Modell will open the discussion with a presentation of some of the broader principles of treatment and a consideration of the pharmacology of some of the drugs employed.

DR. WALTER MODELL: There are four general problems in the treatment of urinary infections: (1) the regulation of urinary volume, (2) the regulation of the urinary p_H, (3) the effect of antiseptics on the human host and (4) the effect of the antiseptics on bacteria.

Urinary volume may be shifted in either direction, toward an increase or a decrease. The volume of urine may be increased in an attempt either to flush out the urinary tract or to dilute the irritants which are found in infected urine, or it may be decreased to obtain a more concentrated solution of an antiseptic which is being used. Either can be achieved by regulating the water intake. To increase the volume, as much as 5 or 6 liters of water a day may be given; to decrease it, fluid may be limited to 1 or 1.5 liters a day.

The regulation of the p_H of urine is important. A change of the urinary p_H may itself exert antiseptic actions. Furthermore, some of the antiseptic agents are either most effective or effective only within certain p_H ranges. In an extensive series of observations the p_H of normal urine was found to vary from about 4.8 to 7.5, with the mean at about 6. The excretion of acid urine is an expression of mechanisms in the body which maintain the constancy of p_H in the blood. Because of the efficiency of these mechanisms it is possible to achieve marked changes in urinary p_H without affecting the p_H of the blood. The important buffers in the urine are the *mono*-sodium *di*-hydrogen phosphate and the *di*-sodium *mono*-hydrogen phosphate. In the plasma the ratio of acid to basic phosphate is about four to one in favor of the basic phosphate. In the excretion of these substances by the kidneys most of the basic phosphate is reabsorbed in the tubules and the acid phosphate is excreted so that in the urine the ratio is reversed to about nine to one in favor of the acid phosphate. However, if the diet is alkali forming, more of the basic phosphate is excreted and the urine becomes alkaline.

The urinary p_H can be changed by dietary measures by interference with the carbohydrate and fat metabolism and by the use of drugs. In a general way a vegetable diet or alkaline-ash diet results in the development of alkaline urine, whereas a high protein diet or acid-ash diet produces an acid urine. There are some vegetables which contain benzoates which give rise to the elimination of hippuric acid, which in turn tends to acidify the urine. It is rarely possible by dietary measures alone to produce the extremes of acidity and alkalinity which are therapeutically useful. The ketogenic diet will be discussed later.

Alkalizers are sodium and potassium bicarbonates, sodium and potassium citrates and sodium and potassium acetates.

Acidifiers are solution of hydrochloric acid, solution of phosphoric acid, solution of nitrohydrochloric acid, sodium acid phosphate, ammonium chloride and ammonium acid phosphate.

Drugs afford the simplest way of changing the urinary p_H. In order to make the urine alkaline there are a number of alkalis other than those listed which are effective. Sodium or potassium bicarbonate may be given, but the citrates and the acetates are used more frequently because they have little effect on gastric acidity. In the body the latter are oxidized and excreted mainly as carbonate, so that the urine becomes alkaline.

There are various substances which make the urine acid. One can use acids: hydrochloric acid, phosphoric acid or nitrohydrochloric acid. One of the most commonly used drugs for acidifying is sodium acid phosphate. I think it deserves special mention. Sodium acid phosphate is a buffer. It acts as such when eliminated in the urine and therefore is not a very reliable acidifying agent. It has been reported to make some urines more alkaline. Sodium acid phosphate was used most enthusiastically when urinary acidity was determined by titration against alkali. However, when changes in urinary acidity were studied in terms of hydrogen ion concentration it was found that the sodium acid phosphate was not as effective as formerly thought. It is also important that sodium acid phosphate is poorly absorbed, and if large doses are taken it acts as a cathartic.

The ammonium salts are much more reliable, and it is easy to understand why. In ammonium chloride, for example, the ammonium fraction is split off and converted into urea, leaving free hydrochloric acid; similarly with other ammonium salts, free acid radicals are left after the conversion of the ammonium to urea. It is therefore possible to effect marked changes in urinary p_H, and if large doses are used it is also possible to produce a true acidosis. This is an especially important consideration in the face of renal insufficiency. If the usual doses of ammonium chloride do not produce acid urine it is wise to examine the carbon dioxide combining power of the blood to determine whether acid is accumulating in the blood. The impaired kidney may not be able to excrete acid rapidly enough and acidosis may develop without appreciable change in the p_H of the urine.

I think it is well to mention in discussing urinary acidity that it has been stated that therapeutic doses of the acidifying agents cannot shift the urinary p_H beyond the extreme acid limits of normal urine; that is, beyond 4.7 or 4.8.

The use of alternate acidification and alkalization in an attempt to eliminate infections is, I think, outmoded. It has been shown that certain organisms, such as B. coli and some of the streptococci and staphylococci, remain viable in mediums the p_H of which is beyond the limit to which one can shift the urine either in the alkaline or in the acid direction by the use of drugs.

URINARY ANTISEPTICS

A partial list of some of the urinary antiseptics which have been used includes oil of santal, hexylresorcinol,[1] pyridium,[1] serenium,[1] picochrome (benzochrome),[1] methylene blue, mercurochrome, acriflavine, potassium permanganate, strong protein silver, methenamine, sulfanilamide, the ketogenic diet (beta-hydroxybutyric acid) and mandelic acid (sodium and ammonium mandelate). Antiseptics come and go, and the only ones who remain faithful to their memories are their manufacturers.

Up until very recently one of the most common drugs taken by mouth was methenamine. In an acid medium methenamine breaks up and liberates free formaldehyde. A urinary p_H of 5.5 or less is required for this effect. It has been said by some that 0.5 per cent of methenamine is not effective against most organisms and that this concentration is much too irritant to the mucosa of the urinary tract to be used. However, there are many clinicians who have found methenamine an effective agent in the treatment of infections, perhaps the most reliable until recent years.

I think the most important thing about the dyes used in the treatment of urinary infections is that experimentation with some of them aided in the discovery of neoprontosil and sulfanilamide.

We have discussed sulfanilamide here before, but there are several things I want to emphasize:

1. Sulfanilamide not only is excreted in the urine but it also permeates all the tissues of the body, so that it has the advantage of affecting organs associated with the urinary tract, such as the prostate and seminal vesicles, which are not drained or flushed by urine.

2. As sulfanilamide is quantitatively excreted in the urine, it is possible by controlling the urinary volume and regulating the dosage to achieve desired concentra-

1. These do not stand accepted by the Council on Pharmacy and Chemistry.

tions of sulfanilamide. The minimal effective concentration in the urine is said to be between 100 and 200 mg. per hundred cubic centimeters, or between 0.1 and 0.2 per cent of sulfanilamide.

Sulfanilamide is said to be most effective in an alkaline medium, but alkaline urine is not essential since it is quite effective in an acid urine as well.

The ketogenic diet, which consists primarily of eggs and heavy cream, has been shown to be an effective means of treating urinary infections. In the ketogenic diet because of the limited amount of carbohydrate the high fat content is not completely metabolized and large amounts of the ketone bodies are eliminated in the urine, the urine becoming highly acid. The chief disadvantage is that it is very unpleasant and that the amounts of eggs and cream used run up the cost of therapy considerably. It has been demonstrated that the effective agent in the ketogenic diet is beta-hydroxybutyric acid, which is eliminated in the urine. Unfortunately beta-hydroxybutyric acid cannot be used in the normal as a therapeutic agent because it is completely metabolized except in the presence of ketosis. It may, however, be used to fortify the ketogenic diet itself or it can be introduced directly into the urinary tract. It was the bactericidal action of beta-hydroxybutyric acid which led to the discovery of mandelic acid.

Rosenheim, investigating a number of hydroxy acids, found that mandelic acid, which is eliminated quantitatively in the urine, is effective against a number of bacteria in vivo as well as in vitro. Mandelic acid is effective only when the p_H is 5.5 or less. The minimal concentration of mandelic acid necessary in the urine is about 0.5 per cent, although if the p_H of the urine is considerably below 5.5 a less concentrated urine may be effective. Mandelic acid is fairly rapidly absorbed, and twenty-four hours after a single dose almost all of it is eliminated in the urine. Mandelic acid often causes gastric disturbances, and it has also been reported that it causes transient renal function changes. In order to avoid the gastric disturbances, the sodium salts and the ammonium salts of mandelic acid have been used. It is well to mention that ammonium mandelate has the additional advantage of being an acidifying agent. However, even with ammonium mandelate it is generally necessary in order to get urine sufficiently acid to use some acidifying salt, such as ammonium chloride and dietary measures. The water intake is usually limited.

The drugs I have considered are those which, when taken by mouth, are eliminated as effective agents in the urinary tract. These act presumably from the renal pelvis down. There are various substances, such as acriflavine and other acridine dyes, the silver proteinates and potassium permanganate, which are injected directly into the urethra and sometimes into the bladder. There are advantages in each method of treatment. However, a urinary antiseptic which can be taken orally generally acts for a considerably longer period of time than those introduced directly into the urethra and also acts over a greater part of the urinary tract.

The broad pharmacologic aspects which have been considered are not the only factors which determine the therapeutic regimen in urinary infections. There are other clinical features in patients which influence the choice of drug and details of therapy. These will now be discussed.

SOME PRACTICAL CONSIDERATIONS OF TREATMENT

DR. ALEXANDER R. STEVENS: The practical application of these drugs I think should be preceded by a few observations on the different kinds of infections that occur in the urinary tract. Otherwise one proceeds rather blindly. As you know, urinary infections may be put into two groups with respect to the initial site. They may begin in the excretory part of the urinary tract and therefore show pus and bacteria in the urine very early, or they may begin in the deeper structures, notably the parenchyma of the kidney and prostate, and may not show any pus or bacteria in the urine. One has two very different problems in these two types of cases. In individuals with pus and bacteria in the urine one might expect benefit from the use of a drug which is excreted in the urine as an antiseptic, a bactericide or even only a bacteriostatic agent, whereas one would expect, a priori, little or no help at all in treating, for instance, a cortical infection of the kidney or prostatitis. It is only in comparatively recent times that we have had an antiseptic drug which is present actively in the blood and the tissues as well as the urine. That widespread activity opens up the field of the treatment of deep-seated infections.

As for urinary tract infections that occur with pus and bacteria in the urine, there again one must consider two groups: one without any foreign body or obstruction in the urinary tract, and the other with foreign body or an obstruction. Those patients without any calculus, which is the foreign body I refer to especially, or without any obstruction in the urinary tract (whether it is in the ureter, bladder or urethra, the problem is one) may acquire acute infection and recover spontaneously without any specific treatment. Indeed, one meets with many such acute infections, which clear up entirely without any recurrences, with merely hygienic care and rest in bed, whereas the patients who have foreign bodies (such as drainage tubes and calculi) or obstructions are rarely permanently relieved of urinary infections without the proper care of those foreign bodies and obstructions. Occasionally one can sterilize the urine behind the obstruction, but usually not until that obstruction is taken care of. The tendency these days I think is to give one of these more potent, more recent, remedies and forget the underlying trouble which not only makes possible and probable a quick recurrence of infection but also may itself do considerable harm to the upper urinary tract.

Most of the antiseptics that have been listed here I think are enumerated largely for historical perspective. I myself have tried practically everything on that list and would be perfectly willing in practice to eliminate everything down to methenamine (urotropin). Many of the other drugs are notable largely for their colors, both before administration and as excreted in the urine. If a patient wants his linen stained any particular shade, one can pick a drug to accommodate him but that is about all the satisfaction he gets. Many articles have been written on all of these so-called antiseptics, listing records of hundreds of patients who have profited by them, but I think you will find that most urologists today are very skeptical of the whole batch.

Methenamine, as you have just heard, is active chiefly because in an acid urine it breaks down, producing formaldehyde, but it is active only in urine and not in the tissues. It is excreted from the kidney as such

and breaks down after excretion, so that one may expect help only in the type of infection that is associated with the excretory urinary passages. This therapy is comparable to continuous irrigation over the mucous membrane with a very mild antiseptic solution. It does not get down in the depths of the tissues. If you are dealing with a deep-seated infection of the kidney, the pelvis, the bladder or the prostate, little or no therapeutic aid should be expected from methenamine. Its great value I think is as a prophylactic. I have often asked patients whom I was going to treat instrumentally to start taking methenamine twenty-four hours before the treatment and keep it up for twenty-four hours afterward and then quit, merely with the idea that we might prevent multiplication of any bacteria introduced by the passage of urethral instruments.

The ketogenic diet I will speak of very briefly. I think Dr. Modell was very mild in his description of the patient's attitude toward that diet. I have had individuals who could stick it out for a week, and that is about as far as most people want to go. One patient after a week of it would start vomiting when she heard the maid coming down the corridor with her meal tray. The food did not even get into the patient's room. The very thought of all that fat, the olive oil, the butter and the cream started things going. When the ketogenic diet could be replaced by mandelic acid therapy with apparently equal benefit to the patient, there was certainly a tremendous advance.

Mandelic acid is employed very widely. It operates, as you have heard, only in an acid urine. If given in the form of the ammonium salt, it tends to make the urine acid. If necessary to secure greater acidity, one of various drugs may be added, usually ammonium chloride or nitrate. It is necessary to have at least a half of 1 per cent mandelic acid in the urine to be most effective. Some authors suggest twice that much. As you have just heard, the more acid the urine, the more effective the mandelic acid, so that with a very acid urine a lower strength of mandelic acid may suffice. It is usually not given in large enough quantities. It is wise to administer about 12 Gm. in a twenty-four hour period in order to secure sufficient concentration in the urine. Mandelic acid is effective with most organisms which occur in the urine but remember that this therapy is satisfactory only when the p_H of the urine is 5.5 or lower. With certain bacteria, notably the proteus, one rarely can secure such a reaction. Hence in these instances mandelic acid is useless.

Finally the great concentration these days is on sulfanilamide, which has quite revolutionized the treatment of infections in urology. Here is a drug that is potent in dealing with nearly all bacteria, whether found in an acid or an alkaline urine. Those who have done the most work find one or two organisms that are not much influenced by sulfanilamide, but it does dispose of most of the organisms commonly found in urine (cocci and bacilli) excepting the tubercle bacillus. I do not think anybody has claimed anything for that. As sulfanilamide is somewhat more effective in alkaline urine than in acid urine I make a practice, in common with many others, of giving an alkali with the sulfanilamide. There is the great advantage too that it may be administered under the skin or intramuscularly and also intravenously, but the latter route is not very often necessary.

The dosage is usually up to from 5 to 6 Gm. in a twenty-four hour period. The rule that some have advised, which I think is a very good one, is 1 gram for each 20 pounds of body weight, with a maximum, however, of perhaps 6 Gm.; but in some instances patients have tolerated well as much as from 10 to 15 Gm. a day.

There are certain toxic possibilities associated with sulfanilamide that we do not have with most of the other urinary antiseptics. Hence I think one should be cautious in giving sulfanilamide to patients who are not confined to bed and not under constant observation.

There is one drug which is not on the list presented for consideration, which I think you ought to know about, and that is arsphenamine or neoarsphenamine, which is very potent in some instances of coccic infection. Until all this furor over the two new drugs, it was one of the outstanding marvels in urology that in some cases of a pure staphylococcic infection of the urinary tract, which is not very common and which often resists all other forms of treatment, the infections react favorably and quickly to that drug given intravenously.

SPECIAL CONSIDERATIONS RELATING TO TREATMENT DURING PREGNANCY

DR. HERBERT F. TRAUT: I am very glad that Dr. Stevens pointed out the importance of obstructions in connection with urinary tract infections. In pregnancy we have to deal with a physiologic obstruction. The hormones of pregnancy which relax the smooth muscles of the uterus and thus make the continuation of pregnancy possible have a similar effect on the urinary tract. They produce an atony of the ureter, so that its normal peristaltic activities are suppressed and sometimes obliterated. In addition, as pregnancy progresses there is enlargement of the uterus, when the woman is in the upright position the inlet of the pelvis is blocked, and the ureters are occluded more or less completely. The result is urinary stasis, dilatation of the tract and the formation of what has come to be known as the physiologic hydro-ureter of pregnancy.

Unfortunately some women who become pregnant have had pyelitis previously without complete eradication of the infection. In these women who may have chronic pyelitis the physiologic obstruction provides an opportunity for exacerbation. They may, however, have the primary attack during pregnancy. The factors important in the development of the primary attack are not all understood. There is investigative work needed before we shall know as much as we should about the etiology of the disease. However, we feel we have made a step ahead in that we understand some of the causes and can now obviate many of the features of the physiologic stasis associated with pregnancy.

There is also another factor which makes infection of the tract a little more frequent in the pregnant woman or in the parturient woman, and that is that the trauma of delivery necessarily affects the base of the bladder and probably makes the bladder more susceptible to infection. This background in a bladder which is atonic, which tends to overfill, requiring repeated catheterization in the puerperal period with the inevitable introduction of organisms with each passage of the catheter, certainly makes for a situation which is productive of a fairly high incidence of postpartum urinary tract infections. The incidence of pyelitis in pregnancy in New York is about 2 per cent in our experience.

We are particularly interested in treatment today so perhaps we had better give most of our attention to that phase of urinary tract infections in pregnancy.

The first thing which we ought to consider is prophylaxis. How can these urinary tract infections in the pregnant woman be obviated? There are certain prodromal symptoms which, if sought for when the patient comes for antepartum care, give a pretty good indication of impending upper urinary tract infection. Dysuria is frequent but a more common complaint is pain in the flank or even in the costovertebral angle of the right side. Often an intravenous pyelogram of a patient complaining of these symptoms demonstrates a high grade hydro-ureter and hydronephrosis of the type common in pregnancy. These symptoms can be controlled quite satisfactorily by having the patient lie down frequently, to take the weight of the uterus off the ureters. In addition the patient may be given a grain or 1½ grains of quinine one, two or three times a day.

More important, if there is dysuria and clumped pus cells in the urine, it is time to force fluids, alkalize the urine or use methenamine in an acid urine. I think it is fair to say that if it was possible to get every pregnant woman early in the pyelitis and give her this conservative care, one probably could abort a high proportion of primary cases of early pyelitis. That is not necessarily true of the chronic cases which are exacerbations of a previously existing urinary tract infection. We watch for both types in the antepartum clinic with a good deal of care and feel that we do abort a fairly good number of pyelitis cases in their incipience.

In a full blown upper urinary tract infection, with a hectic type of fever, what is to be done? The patient must go to bed; the horizontal position with drainage is just as important as ever. We find what the causative organism is because in our experience mandelic acid, as Dr. Stevens pointed out, is of very little use with the proteus type of organisms, but certainly with the aerogenes it should be used. With a proteus type of organism we use sulfanilamide. We prefer to use sulfanilamide for all other types of infection when the patient is in the hospital. On the other hand, if the patient is ambulatory, we still adhere to the use of mandelic acid except with the proteus organism.

There are several things to be observed in the patient who is actively febrile. In the first place, one must determine whether the infection is unilateral or bilateral. If it is bilateral one cannot afford to use palliative measures for months. What Dr. Stevens said about clearing up infections in the presence of obstructions is absolutely true. In pregnancy we can seldom clear the tract of infection during pregnancy. All we can do is to palliate, hold it in abeyance, and the real curative process must wait until after the pregnancy has been terminated and the obstruction removed. We are interested in bilateral infections because the inflammatory reaction going on over periods of months may produce damage in the mother which is out of proportion in its complications to the loss of the child. We always carefully evaluate these patients with bilateral involvement, particularly if there is a great loss in weight. If the infection does not yield after eight or ten days of conservative treatment, and particularly if the patient has a couple of months to go to reach term, we consider the advisability of interruption of pregnancy. We do not resort to it very often; however, the possible necessity is always in the back of our minds. The other thing we watch for particularly is involvement of the renal cortex. The earliest indicator we have of this complication is elevation of the nonprotein nitrogen in the blood. If this rises to above 50 mg. per hundred cubic centimeters we empty the uterus regardless of whether the lesions are bilateral or unilateral, because in our experience we have had great regrets when we have neglected the warning. The death rate in individuals who have a nonprotein nitrogen of over 50 mg. per hundred cubic centimeters—the normal in pregnancy is about 30 or 35—is about 25 per cent, a very high mortality.

We use mandelic acid in an acid urine exactly as has been outlined. With sulfanilamide therapy we like to administer 4 or 5 Gm. a day, always with sodium bicarbonate. We prefer not to give it to ambulatory patients but rather to get the patient into the hospital so as to force the treatment rather than to carry it out over a prolonged period. We have had very satisfactory results with both of these drugs.

In closing, I want to emphasize again that we do not cure patients of upper urinary tract infection during pregnancy. They must be followed afterward. The follow-up must be done in a cystoscope clinic, and sometimes it takes from three months to a year to eradicate the infection completely. The addition of mandelic acid and sulfanilamide to our armamentarium has helped very much.

If a patient has had pyelonephritis or bilateral upper urinary tract infection, we like to allow a year or two years to pass before pregnancy is again contemplated. We give contraceptive advice to these individuals, and if pregnancy does occur we hospitalize them and evaluate renal function before we allow pregnancy to progress. We are a little radical in our attitude because in bilateral pyelitis and in well authenticated pyelonephritis we have had very serious sequelae.

DR. CATTELL: Urinary infections present a common condition in children, and I will ask Dr. Levine if he will say something regarding the special problems which arise in connection with the treatment of urinary infections in infancy and childhood.

DR. SAMUEL Z. LEVINE: The general subject has been adequately covered. Perhaps we should define what we mean by urinary tract infection in childhood before we go on to a discussion of it.

Does urinary tract infection in childhood mean the presence of both pus and bacteria in the urine or may it be represented by a bacilluria in the absence of a pyuria? This still remains a moot question, but in routine catheterizations of thirty-four female infants under 2 years of age bacilli were found in 28 or 82 per cent of the urines in the absence of any white blood cells, indicating that bacilluria in infancy is a more common condition than we are prone to believe. In twenty-one cases B. coli was present in the urine in the absence of demonstrable infection of the urinary tract. The term pyuria should be limited to the persistent presence of clumps of pus in uncentrifuged, clean specimens of urine. Only these urinary observations represent a true urinary tract infection in childhood.

Of some interest is the question of terminology. At one time the name pyelitis was given to all types of urinary tract infection in children. There is no evidence at the present time to indicate that the entity pyelitis per se, inflammation of the pelvis of the kidney, in the absence of interstitial suppurative involvement of the kidney, is a common phenomenon. In most autopsies one finds in addition to the inflammation of the pelvis interstitial abscesses in the kidney parenchyma itself, so no longer do we use the term pyelitis but

prefer the terms acute and chronic pyuria, leaving the localization of the site of infection unnamed.

Urinary stasis probably plays as important a role in producing urinary tract infections in childhood as in pregnancy. Only rarely does one see a chronic or a recurrent pyuria in childhood in the absence of a congenital anomaly producing urinary stasis and secondary infection. If medical therapy is ineffective in overcoming the pyuria after a period of from four to six weeks, all children should be subjected to complete urologic examination. In over 90 per cent of chronic pyurias in childhood we find associated congenital anomalies.

In discussing the therapy, I shall also confine my remarks to the ketogenic diet, mandelic acid therapy and sulfanilamide.

Ketogenic diets are as unpalatable in childhood as they are in adult life.

Mandelic acid therapy is as effective in childhood as in adults. The dosage that we use aims to produce a urinary concentration of between 0.5 and 1 per cent and a reaction of less than 5.5 (p_H). If one gives approximately 1 Gm. of mandelic acid per excreted hundred cubic centimeters of urine, it should be within the required dosage. Since infants excrete about 400 to 600 cc. of urine a day, 4 Gm. of mandelic acid in divided dosage is usually adequate. Similarly, in children about 12 years of age who excrete around 1,200 to 1,500 cc. of urine, 12 Gm. of mandelic acid daily usually produces a urinary concentration of between 0.5 and 1 per cent. It is often necessary to use an accessory acidifier such as ammonium chloride in doses sometimes as high as from 2 to 8 Gm. daily to obtain the desired urinary p_H of 5.5 or less. It has been pointed out that mandelic acid therapy is ineffective in B. proteus infections. Similarly, one should not resort to the use of ammonium mandelate when one is dealing with organisms that liberate ammonia, like aerobacter or pyocyaneus. Sodium mandelate or calcium mandelate plus sodium acid phosphate are preferred in these types of infections.

Sulfanilamide, because it requires neither an acid ash diet nor restriction of fluid, and because it can be administered much more easily, is the choice of therapy in childhood except in the presence of infections due to Streptococcus faecalis, which are apparently resistant to sulfanilamide. The dose which we use in children is 0.2 Gm. per kilogram of body weight daily. We do not regularly use an alkalizer because we have found that if the urine is not too acid the sulfanilamide is almost as effective at a p_H of 6 as at a p_H of 7. The simplest way to test the p_H of the urine, whether we are using mandelic acid or sulfanilamide, is by means of chlorophenol red or nitrozine paper.

Finally, in using both mandelic acid and sulfanilamide, the drugs should be given for a minimal period of ten days to two weeks, even when the urine clears more rapidly than this, because the pyurias are prone to recur with shorter periods of therapy.

DR. MODELL: I should like to add one thing: I have listed on the board but failed to discuss the properties of the ideal urinary antiseptic. I merely wanted to mention that there is no such substance.

Properties of the ideal urinary antiseptic are rapid absorption from the intestine, rapid and continuous elimination in the urine, that it shall be nontoxic and nonirritant for human beings, effective against all bacteria, effective in alkaline and acid urine, active in the presence of obstruction, that it shall act from the renal pelvis down and that it shall be satisfactory in febrile states and in renal insufficiency.

DR. LEVINE: Dr. Traut, when you refer to the pyelitis of pregnancy, do you intend to imply disease of the renal pelvis alone?

DR. TRAUT: We just use it for old times' sake. We make the same objection to it that you do. However, we do not feel that we have as frequent involvement of the parenchyma of the kidney in the upper urinary tract infections in an adult woman as you would indicate was your experience with the chronic pyurias of children.

STUDENT: Are pyurias in children necessarily accompanied by parenchymal involvement?

DR. LEVINE: I did not mean to leave the impression without some reservation. In animal experimentation infections of the pelvis of the kidney have been produced in the absence of parenchymal involvement, but in the chronic pyurias and in many of the acute pyurias of childhood I think there is an associated pyelonephritis or a suppurative interstitial nephritis.

DR. JOHN E. DEITRICK: I should like to ask about the dosage of sulfanilamide when there has been involvement of the kidney. In a few cases I have seen, in which there was decreased renal function, if one gave sulfanilamide the amount in the blood rose rapidly, even when a small dose was used. No mention has been made about determining the blood level, which I feel is important if a patient has an elevated urea nitrogen or other evidence of inability of the kidney to function normally. We have seen toxic symptoms and found the blood level very high, although we had not reached a dosage ordinarily used in an adult person.

DR. STEVENS: I do not recall that I have had reason to employ the drug in a case with as marked renal involvement as described, but I remember that one of the articles by Helmholz records four or five patients with nonprotein nitrogen up around 50, 60, or even more, who excreted the sulfanilamide in large quantities, and that he obtained good clinical results in combating infections. The point has been made by various observers that one may expect more from that drug than from mandelic acid in individuals with poor renal function, as indicated by high nonprotein nitrogen or the high urea nitrogen in the blood.

DR. CATTELL: The universal distribution of sulfanilamide throughout all the cells and fluid of the body would suggest that it might be present in effective concentration as long as any urine was excreted.

DR. STEVENS: I think it has not been demonstrated how much of the efficiency of the drug in urinary infections comes from the excretion in the urine and how much comes through the body fluids. I did not mention the use of sulfanilamide in the treatment of gonorrhea; we did not have time for it. It has been found that as high a percentage of sulfanilamide may be found in the urethral pus as is found in the urine of the same individual, which I think is a very suggestive observation.

DR. HARRY GOLD: I notice that as urinary acidifying agents sodium acid phosphate and ammonium acid phosphate are being considered as interchangeable. I might call attention to the fact that a paper was presented at the federation last year in which a comparison was made between the urinary acidifying power of sodium acid phosphate and ammonium acid phosphate, and it was found that sodium acid phosphate in the usual

doses that are employed is much less effective as an acidifying agent than ammonium acid phosphate. Furthermore, ammonium acid phosphate is not very irritant to the gastrointestinal tract and can be used in very large doses, larger doses than sodium acid phosphate, without gastrointestinal symptoms.

DR. MODELL: There is a similar report by Alstead on the effect of ammonium acid phosphate, in which he stated that it was superior both to ammonium chloride and to acid sodium phosphate.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING ABSTRACT AND APPRECIATION.

HOWARD A. CARTER, Secretary.

ABSTRACT OF MINUTES, MEETING OF COUNCIL ON PHYSICAL THERAPY, JANUARY 13-14, 1939

The Council on Physical Therapy held its annual meeting on Jan. 13-14, 1939, at the headquarters of the American Medical Association. The members present were Dr. Harry E. Mock, chairman, Drs. Anthony C. Cipollaro, William W. Coblentz, John S. Coulter, Arthur U. Desjardins, Walter E. Garrey, Howard T. Karsner, Frank H. Krusen, Frank R. Ober, Horatio B. Williams and Mr. Howard A. Carter, Secretary. Drs. Frank Dickson and Ralph Pemberton were unable to attend.

Dr. Mock was reelected chairman and Dr. Garrey vice chairman.

INTERFERENCE WITH RADIO COMMUNICATIONS BY ELECTROMEDICAL EQUIPMENT

A report was presented of an informal meeting held in New York, Jan. 9, 1939, at which representatives of the Federal Communications Commission and medical profession, specialists in the communication field and manufacturers of electromedical apparatus were present. It was the opinion of the committee reporting that a mutual understanding among the groups present had been reached. The committee reported that the engineers of the Federal Communications Commission and of the radio manufacturers demonstrated by the use of aural reception and television the effects of the interference of electromedical equipment. Although television has not been commercially practicable up to the present time, it was expected that television sets will be on sale during the summer and, in the opinion of the manufacturers of this equipment, interference by electromedical equipment might seriously retard the advancement of television. The members of the medical profession present at the meeting strongly emphasized the importance of electromedical equipment, especially electrosurgery in the treatment of cancer, diseases of the skin, and so on, and the use of medical diathermy in the treatment of those diseases in which internal heat is indicated.

Two solutions were proposed: (1) screening of the treatment room and (2) the allocation of radio bands or channels. The representatives of the radio industries felt that screening the treatment room was to be desired and that the cost might not be excessive. It was pointed out, however, by the physicians and manufacturers that the moving of surgical and medical diathermy equipment from place to place would be prohibitive and that the screening of an entire hospital or clinic would be almost impossible.

The alternative suggestion of allocating certain radio channels to the medical profession seemed to be the most suitable in view of the seeming impracticability of screening. The difficulty involved in the allocation of channels, however, seems to be that operating the equipment on a given frequency within certain toleration limits and keeping it on that frequency would increase the cost of the equipment. The Council was reminded that apparatus purchased and being used now would become obsolete unless time is allowed before regulations go into effect. The request, therefore, was made by the representatives of the medical profession that the same courtesy be shown to them as was granted the owners of ships equipped with radio apparatus of the spark gap type. Ship owners were allowed eight years from a certain date to liquidate the apparatus and to substitute more modern equipment. The suggestion was made, therefore, that the users of electromedical equipment already sold be allowed eight years to realize on their investment and that the manufacturer be given at least two years in which to change over and make new types available.

The accomplishments of this meeting were (1) a frank discussion of the problems of interference, (2) a visual demonstration of radio interference in television, (3) a presentation of the importance of electromedical equipment as used by the profession and (4) a mutual understanding of the problem involved. A committee of the Council was appointed to continue the study of this problem in an endeavor to cooperate with the interested bodies.

SHORT WAVE DIATHERMY

The Council voted to retain as one of its requirements for the consideration and acceptance of short wave diathermy apparatus the submission of six observations of the heating effects in the human thigh as observed by a thermocouple inserted before and after a twenty minute application of each technic promoted by the manufacturer. Acceptance is to be granted only to apparatus for technics the evidence for which has been submitted.

Minor changes in the manufacture of short wave apparatus, for example change in style of cabinet, nonessential revision in circuit or the substitution of more powerful thermionic tubes, as indicated by the lamp load test provided the temperature of the transformer does not rise beyond the safety point, is not to be considered sufficient alteration in design to warrant thermocouple-thigh test data being submitted for reacceptance.

Fundamental changes in circuit, reduction of power output as determined by lamp load test, promotion of different technic of application, change of frequency and fundamental changes in conversion of electrical energy to high frequency are to be considered important changes in the apparatus to warrant the submission of six observations of the temperatures in the human thigh as observed by the thermocouple for each technic of application recommended or promoted. For a recommended technic to be accepted, the final average temperature after twenty minute application of high frequency electrical energy shall be at least 103 degrees Fahrenheit in the deep tissues of the superior aspect of the human living thigh.

ORTHOPEDIC APPLIANCES

A discussion of problems with relation to the Council's consideration of orthopedic appliances, i. e. corsets, belts, supports and shoes, resulted in adoption of a motion to the effect that these appliances would not be considered by the Council after Jan. 1, 1940. It was decided, however, to sponsor the publication of several informative articles on the subject of shoes, corsets, trusses and abdominal supports.

AUDIOMETERS AND HEARING AIDS

A review of the Council's work in the consideration of audiometers and hearing aids was presented, and after some discussion it was generally agreed that the Council will continue its consideration of audiometers without restriction of advertising until further study is made in the field. The Council will continue to consider hearing aids and prepare reports for publication in THE JOURNAL.

ROENTGEN RAYS

The Council discussed ways and means of continuing its consideration of roentgen ray apparatus. It was agreed that cooperation with other interested bodies would have to be secured before the Council could proceed with its investigations.

RADIUM AND RADON

It was pointed out that the House of Delegates had adopted a resolution presented by the Judicial Council at the annual session of the American Medical Association in 1938, condemning the practice of renting radium to unqualified physicians. The Council therefore adopted the following resolution:

WHEREAS, The Council on Physical Therapy has long been opposed to the practice of indiscriminate rental of radium or sale of radon by certain commercial firms and private physicians, who, possessing radium, undertake to supply radium or radon to any physician who may apply,

regardless of his special training and experience in its use, and who even furnish instruments and instructions without having seen or examined the patient; and

WHEREAS, This constitutes the practice of medicine by mail or by telephone; and

WHEREAS, Four years ago the Council on Physical Therapy passed a resolution condemning this practice but, when this resolution was submitted to the Board of Trustees of the American Medical Association for approval, the Board of Trustees voted against it; and

WHEREAS, During the past year, at the instigation of Dr. Edward H. Skinner (Kansas City), the House of Delegates of the American Medical Association passed an essentially similar resolution, which had been presented by the Judicial Council and confirmed by the Board of Trustees; and

WHEREAS, This action implies that, since the American Medical Association has officially condemned the practice, the columns of THE JOURNAL (and indirectly the columns of most of the journals of the state medical societies) should be closed to any advertising that would tend to foster the practice; be it

Resolved, That the Council on Physical Therapy is deeply gratified by and heartily approves the action of the House of Delegates, of the Judicial Council and of the Board of Trustees. The Council stands ready to investigate the products, review the advertising and, as part of its duty, make this information available to THE JOURNAL.

It was also agreed to arrange for the preparation of a series of Council articles on the dangers of the indiscriminate use of radium.

RESEARCH

The Council considers problems of merit in research and believes that there are a number of subjects of vital importance in the application of physical agents to the treatment of disease worthy of investigation, and that investigations of such subjects would lead to important contributions to the practice of physical therapy. During the year 1938, one grant was awarded for research.

EDUCATION

A lengthy report of the activities of the various Council members and consultants in this field was presented. It was suggested that articles be published during the coming year on the following subjects: spastic paralysis, peripheral nerve injuries, the abuse of medical diathermy, the injudicious use of radium, the use of corsets, abdominal belts and trusses, and the effect of ultraviolet radiation on the production of cutaneous cancer.

APPARATUS ACCEPTED, THE COUNCIL'S PUBLICATION

The members of the Council expressed the opinion that the use of diathermy and other methods of producing heat within the tissues is being greatly overrated and abused, and that too much emphasis is being given to machine therapy. The Council believes that the profession should be informed of these abuses by means of a Council article pointing out that other methods of physical therapy are of greater importance, for example the intelligent management of the patient, the proper use of therapeutic exercise, massage and hydrotherapy.

After some discussion concerning the booklet "Apparatus Accepted," action was taken to initiate a review of the booklet with the idea of revising it to increase the amount of information to the general practitioner concerning the value of the various accepted devices.

EXHIBITS

Plans for the exhibit at the annual session of the American Medical Association in St. Louis were considered.

Suggestions were also advanced concerning the Council's proposed exhibit on the management and treatment of lame backs. It was agreed that if such an exhibit is approved a film on this subject should also be prepared to be shown at the same time.

NOMENCLATURE AND DEFINITION

A report was made to the effect that work on the definitions is now being carried on and that considerable progress is being made in this line.

PRESENT STATUS OF PHYSICAL THERAPY

The committee assigned to revise the Council's report on the present status of physical therapy announced that work is progressing in this direction and that a report would be made available during the coming year.

AN APPRECIATION

The Council wishes to acknowledge with deepest appreciation the valuable assistance rendered by the following in connection with the work of the Council:

Drs. Fred Adair, M. Herbert Barker, H. C. Bazett, Robert Bennett, William Bierman, Earl Bond, Walter Boothby, R. C. Burt, A. J. Carlson, J. Marion Clampit, Eliot R. Clark, Milton B. Cohen, Geza de Takats, Earl C. Elkins, F. H. Ewerhardt, G. K. Fenn, A. Bruce Gill, F. B. Gordon, Allan Hemingway, John S. Hibben, K. K. Jones, Louis Katz, Disraeli Kobak, Henry Laurens, Arno Luckhardt, George Miller MacKee, Gilbert Marquardt, Albert Martucci, C. O. Molander, Tell Nelson, John R. Pribble, E. M. Smith Jr., K. W. Stenstrom, Grant E. Ward, Francis Carter Wood and Mr. S. L. Osborne.

Artificial Limbs.—Drs. Paul Steele and Philip Wilson and Messrs. William Herman, W. E. Isle, George M. Morris, J. V. Spievak and James Waltz.

Audiometers and Hearing Aids.—Drs. C. C. Bunch, George M. Coates, L. W. Dean, E. P. Fowler, Henry Hartig, Austin Hayden, Isaac Jones, Douglas Macfarlan, Horace Newhart, B. R. Shurly and W. P. Wherry.

Educational Work.—Drs. Richard Dillehunt, Bernard Fantus, A. J. Kotkis, Richard Kovacs, Franklin P. Lowry and William Schmidt.

Ophthalmologic Devices.—Drs. Francis Heed Adler, Charles A. Bahn, S. Judd Beach, William L. Benedict, Conrad Berens, Alfred Cowan, John Evans, Jonas Friedenwald, Sanford Gifford, Walter B. Lancaster, William H. Luedde, John MacNie and Clifford B. Walker.

Roentgen Ray and Radium.—Drs. L. F. Curtiss, William E. Chamberlain, Arthur C. Christie, Edwin C. Ernst, Gioaochino Failla, Thomas A. Groover, Fred M. Hodges, George Winslow Holmes, John T. Murphy, Robert Reid Newell, E. P. Pendergrass, George Pfahler, U. V. Portman, Lauriston Taylor and J. F. Weatherwax.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

SOLUTION LIVER EXTRACT PURIFIED-LILLY.—A sterile aqueous solution of liver extract purified preserved with 0.5 per cent phenol, containing 15 U. S. P. units per cubic centimeter.

Actions and Uses.—Solution liver extract purified-Lilly is proposed for intramuscular injection in the treatment of pernicious anemia. See general article Liver and Stomach Preparations, New and Nonofficial Remedies, 1938, page 321.

Dosage.—For the average patient in relapse, treatment may be instituted with an initial dose of 2 cc. (30 U. S. P. units), or 1 cc. (15 U. S. P. units) may be given on two successive days; then a weekly dose of 1 cc. (15 U. S. P. units) may be given until the red blood cell count and blood hemoglobin have reached satisfactory levels.

For maintenance of the average patient 1 cc. (15 U. S. P. units) is adequate at fifteen day intervals. Especially close laboratory follow-up is indicated whenever the physician takes the responsibility of administering an average daily dose of less than 1 U. S. P. unit.

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THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, APRIL 22, 1939

TRAUMA AND DIABETES

The concept of traumatic diabetes virtually began with Claude Bernard's diabetic puncture. In the earlier literature, which is fairly extensive, appears a report by Asher, who assembled 124 cases and concluded that one was not justified in establishing a causal connection between trauma and diabetes by pathologic changes and physiologic results. Traumatic neurosis was introduced by Ebstein in 1892. A traumatic origin of diabetes was recognized by von Noorden in 1898. In general, authors considered that traumatic diabetes actually existed and that it was a neurogenic diabetes due to trauma in the central nervous system.

Somewhat later Stern felt that clinical observations gave rise to doubts because of the possibility that diabetes was present before the trauma and because the diabetes following trauma is indistinguishable from the diabetes occurring otherwise. Lépine thought that trauma must be considered in 5 per cent of cases of diabetes although noting too the question of hereditary predisposition. Naunyn favored the idea of a traumatic factor and presented eight cases of his own in which diabetes occurred after trauma of the head as well as after noncerebral trauma and traumatic neurosis. Welz in 1915 emphasized that the probability of a relationship between trauma and the disease decreased in the symptom-free interval, placing the limit at from two to three years. As late as 1912 von Noorden still believed in the presence of acute glycosuria of nervous origin but felt that it was doubtful or even impossible that genuine chronic diabetes could persist as a result of a nervous disturbance without the pancreas being affected. Kausch denied the etiologic importance of trauma and raised the objection that in all the reported cases the disease existed before the trauma.

After the World War von Noorden pointed out that it had been an enormous tax on the nervous system, a mighty and terrible physical experiment which must clear up the question whether the notion of chronic neurogenic diabetes and so-called traumatic diabetes shall henceforth be reckoned with. Finally, he concluded that the soldiers who incurred diabetes during the war took the field as men with masked diabetes, whose disease as a rule was merely accelerated. His opinion was shared by Albu, Gottstein, Umber and Hermann Strauss. Lenné differed, relating the disease to physical and psychic strain, but admitted that injuries and diseases have no essential influence on the appearance and character of the disease. Umber agreed with von Noorden and in 1927 declared that no experimental or clinical evidence existed that an injury to the brain, head, trunk or extremities could cause diabetes and that to explain the diabetes one must find diminution in the function of the pancreas. True traumatic diabetes could not be thought to appear unless the pancreas itself was severely injured, because experiments have shown that at least four fifths of the pancreas must be removed before diabetes appears. However, such severe trauma as a rule will lead to death. He considered that the aggravation of diabetes by trauma as a rule is negligible and that, in the majority of cases, it can be suppressed by adequate treatment; nor does it give rise to any persistent change in the future course. Later he emphasized the general hereditary disposition in 26.4 per cent of cases and cited Danforth to the effect that in cases of recessive heredity 72 per cent of the diabetic need not have any diabetic relatives, comprising siblings, parents and their siblings and grandparents, during three generations. Hence it will almost never be possible to exclude definitely the existence of diabetic genes. Umber agreed with von Noorden, who in 1923 stated unequivocably that neurogenic diabetes does not exist, the experiences of the war having put it completely in the grave.

Isaac acknowledges a causal relationship if the diabetes comes on within four weeks after the trauma and Grote agrees that a longer interim renders a causal relationship unlikely. Stern says that a causal relationship is probable only (1) if there are no indications of an earlier existence of diabetes, (2) if the accident has caused a lesion of the pancreas or the central nervous system and (3) if diabetes develops during the first weeks after the accident.

Examinations of the blood sugar were first mentioned in 1915. Dextrose tolerance tests were few and the results difficult to compare because of lack of uniformity. A cerebral concussion is more important in producing hyperglycemia than a cranial fracture.

Thomsen [1] has just made available the only monograph in English on this subject. He examined 100 patients with regard to spontaneous as well as alimentary hyperglycemia and glycosuria at the time of accidents. Blood tests were done on ninety-four of 100 patients, both during fasting and after administration of dextrose, within three days after the accident. His material consisted of 144 patients, forty-four of whom were not given dextrose tolerance tests. Age was important.

1. Thomsen, Viggo: Studies of Trauma and Carbohydrate Metabolism with Special Reference to the Existence of Traumatic Diabetes, Acta med. Scandinav., supplement 91, 1938.

Disturbances in carbohydrate metabolism immediately after the trauma are much more frequent under than over the age of 30, although they are more transitory in the young than in the old. While there are disturbances of carbohydrate metabolism in a considerable number of patients, the distribution of the types of physical trauma into groups shows that no decisive importance can be attributed to the kind and location of the trauma, whether cerebral, peripheral or otherwise, with regard to the frequency and intensity of the detected disturbances.

An increase of the fasting blood sugar was found in twenty-four cases, that is in 17.5 per cent of all the cases. Abnormal dextrose tolerance curves were obtained in thirty-four of 100 cases. In the majority the glycosuria was detected in the portions of urine voided shortly after admission. Sugar was thus found in twenty of thirty-four specimens. In isolated cases it persisted more than seven days; in one, after a sugar-free interim, it contained sugar on the fifteenth day. One patient had renal glycosuria. The glycosuria was usually slight; in only twelve cases was the value above 0.5 per cent. There was no polyuria. In ten cases in which dextrose tolerance tests were performed there was diabetes in the immediate family. Thomsen concluded that no importance could be ascribed to the disturbances of carbohydrate metabolism detected after trauma. The duration of such disturbances, even with the most persistent spontaneous hyperglycemia, based on the fasting blood sugar level, was five days. Dextrose tolerance curves were abnormal once or several times, but in twenty-four cases the abnormal curves were detected only at the first examination, performed within three days after the accident. Fifteen patients, reexamined from three to twenty-nine days after the trauma, presented normal conditions. In one case a disturbance of the carbohydrate metabolism was disclosed by an abnormal dextrose tolerance curve as late as forty-nine days after the accident, while two patients who presented abnormal curves after a lapse of thirty and forty-nine days respectively had a normal curve ninety-seventy and 144 days after the trauma. In none of the patients who survived the accident did diabetes occur in close sequel to it, and this must be supposed to apply also to those patients who died shortly after the accident. The duration of the disturbance in carbohydrate metabolism as well as its frequency was greatest in the higher age groups. In forty-seven of fifty cases a second examination was performed from six to thirty-eight months after the accident. In none of these had diabetes occurred, and in two of the remaining three nothing is known concerning the occurrence of diabetes up to three and one-half years after the accident. One patient was untraced.

To answer von Noorden's question as to whether diabetes is more frequent in persons who have met with accidents than in noninjured persons of the same age and standard of living, Thomsen investigated the material of the district hospital in Aarhus, Denmark, where he was assistant physician. From 1921 to 1935 there was scarcely any difference in the frequency of diabetes in injured and noninjured patients of the same age and standard of life. Thomsen says that he has not seen the description of any case of existing diabetes in which trauma has been proved to have given rise to a permanent change in the degree and course of the disease. In his opinion the trauma, strictly speaking, cannot be incriminated for an indirect exacerbation of diabetes, such as is due to lack of exercise, change in diet, or to the accompanying infection, and such an exacerbation must be disregarded in order to afford an idea of a traumatic exacerbation proper of the diabetes.

From an analysis of 100 cases he finally concludes that in the case of existing diabetes trauma can give rise to an exacerbation, though of a temporary nature. Temporary exacerbation ensues in about half the cases. The exacerbation is independent of the kind and location of the trauma. It appears immediately after the accident and has an average duration of twenty-six days. His studies afforded no evidence that trauma gives rise to a later exacerbation of the disease. It very probably is able to provoke coma only in a predisposed person who has severe diabetes. The effects might be compared with those produced by a stone thrown into a brimful vessel, which it causes to flow over, and a stone thrown into another, not brimful, vessel, in which it merely produces a ripple on the surface of the water.

Does the course of diabetes which occurs or is exacerbated after trauma differ markedly from the course of similar conditions of metabolism? Thomsen points out that, it being so difficult to compare one diabetic person with another, it must be much more difficult to draw reliable conclusions as to whether the patient under consideration would present a different picture if the trauma had not occurred. He then assembles eighty-one cases in which trauma has been reported as a factor in the appearance of the diabetes. One would expect, he says, quoting Joslin, that the age at the onset of the disease would have been under 40 in 38 per cent and above 40 in 62 per cent, and, he asks, should the trauma give rise to diabetes sooner in the younger than in the older patients? Apparently of injured normal persons 72 per cent were below and 28 per cent above 40. Males in this group predominated, 85 per cent, females 15 per cent, instead of Joslin's 64 per cent of females among the diabetic generally. The onset was indefinite in 43.2, gradual in 37, rapid in 14.8 and sudden in 5 per cent. His conclusion is that reported "traumatic" diabetes usually occurs in younger persons, is to a considerable extent a disease of males and behaves in onset and course like ordinary diabetes. Thus with regard only to age and sex was a deviation from ordinary diabetes detected. This deviation depends not on any special mode of

reaction to trauma in young males but merely on the fact that such persons incur injuries with correspondingly greater frequency. Hence the detected deviation cannot be utilized for the assumption of an essential difference between so-called traumatic and ordinary diabetes.

The post-traumatic disturbances of the carbohydrate metabolism detected in human beings by Thomsen's investigations are brought about by reflexes via the sympathetic nervous system. He based this conclusion on tests with ergotamine and considered that these were substantiated by experiments reported on animals.

In the chapter "Does Traumatic Diabetes Exist?" he states that in human beings neither "experimental" nor clinical clues were found to warrant the assumption that post-traumatic sympathicogenic disturbances in the carbohydrate metabolism can lead to diabetes. His own investigations showed that the disturbances of carbohydrate metabolism were always transitory and that subsequent examinations did not reveal diabetes in any of the cases, and he asserts that "traumatic" diabetes does not differ from ordinary diabetes with regard either to existing disposition or to its mode of onset or further course. An examination of the histories of diabetic and nondiabetic persons of the same age and mode of living reveals no difference in the incidence of head trauma and that there is no reason to assume that diabetes is more frequent in injured than in noninjured persons. As to whether trauma can activate latent diabetes, he states that it is apt to cause an exacerbation of existing diabetes, but only a temporary exacerbation, and that there is no evidence of any subsequent exacerbation. Therefore physical trauma cannot be assumed to evoke latent diabetes, at any rate in any other way than that, after the cessation of the effects of the trauma, again one is dealing with latent diabetes. He admits that, theoretically, trauma is able to make a latent diabetic condition manifest. Since diabetes is of no greater incidence after trauma than after other surgical conditions necessitating hospitalization, there is no reason to consider traumas of greater importance as causal factors of the detected diabetes than the other surgical complaints. Pancreatic diabetes is the only form of diabetes the existence of which has been proved by animal experiments, wherefore it must be considered established that trauma giving rise to as extensive a destruction of the pancreas as that required by experiment will be followed by diabetes, and he considers that no such cases have been reported. He excludes Wells's case. He was not conversant with the case from Gräfe's clinic cited by Joslin. Thomsen's monograph was completed before the work of Young in London, who produced permanent diabetes experimentally by injection of pituitary extract.

This work, supported in part by the Norwegian Insulin Fund, is a real contribution to the problem of trauma in relation to diabetes.

FUMIGATION WITH HYDROGEN CYANIDE

Evidence of the superior efficacy of hydrogen cyanide as a fumigant for ships and houses has been rapidly accumulating. As this method becomes applied more extensively, the problems of toxicity and ventilation following use have received special study. After the employment of hydrocyanic acid gas as a fumigant for ships in the tropics, with the technic which has been developed, Gilles [1] states that the average time for clearance of the gas after fumigation has never exceeded six hours. At the expiration of four hours' continued ventilation, the holds and spaces are carefully tested with methyl orange or copper benzidine acetate test paper. When the fumigated space is found clear of dangerous quantities of gas, the crew is allowed on board and, under supervision, all pillows, blankets, mattresses and the like are brought out, hung and aired in the sun. Gilles does not report any toxic effects to the crew from this procedure.

Etteldorf [2] conducted accurate determination of the critical concentration of hydrocyanic acid on twenty-two dogs, seven rabbits, four guinea pigs, five white rats and four chickens and investigated whether the effective and recognized method of detoxification could be exhausted by subjecting dogs to single and repeated dosages of hydrocyanic acid for periods ranging up to eight and twelve hours. He also studied the antidotal and prophylactic value of methylene blue against gaseous hydrocyanic poisoning. The critical level for each species of animal was measured and demonstrated by the onset of convulsions. Below the critical level, hydrocyanic acid is sufficiently controlled for an unlimited time by the detoxifying mechanism of the animal. Evidence of tolerance or increased susceptibility was not obtained. Methylene blue had little value as treatment above the critical level of cyanide poisoning but was valuable as a prophylactic against these concentrations.

Perhaps the most important problem from the practical point of view is the method of ventilation following hydrogen cyanide fumigation. Page and his colleagues [3] investigated this aspect in a series of careful observations in English houses of various types and age and under different weather conditions. Their conclusions in part were that all windows should be kept open for twenty-four hours after fumigation unless this leads to the entry of rain or snow. A ventilation period of this length is generally sufficient for an empty house of normal construction, but a longer period may be required for a furnished house or for a house which is damp, which contains an unusual proportion of dead space or which contains rooms without windows providing adequate communi-

1. Gilles, Eric C.: Fumigation of Plague Suspect Imports in Colombo as a Means of Controlling Plague in the Island, J. Roy. San. Inst. **58**: 76 (Aug.) 1937.
2. Etteldorf, J. N.: On the Detoxification of Gaseous Hydrocyanic Acid, J. Pharmacol. & Exper. Therap. **58**: 431 (Dec.) 1936.
3. Page, A. B. P., and others: The Ventilation of Houses After Fumigation with Hydrogen Cyanide, J. Hyg. **39**: 12 (Jan.) 1939.

cation with the open air. They conclude that fumigation of clothing, and particularly bedding, as a regular practice is undesirable. Further, upholstered furniture should be placed in a position to facilitate airing; the customary tests with benzidine acetate-copper acetate should be made (a blue color in all air spaces indicating a concentration of one one-hundredth or less per thousand cubic feet gives a margin of safety). If the house contains much absorbent material or if any other circumstances suggest that a period of twenty-four hours of airing may not be sufficient, all doors and windows should be closed after performing the tests with benzidine acetate-copper acetate and these tests should be repeated after the house has remained closed for two hours.

Supervision of fumigation is a public health problem. For example, in New York, fifty-three concerns hold permits to conduct the business of fumigation and extermination. From June 1, 1936, to June 1, 1937, there were, according to Oberwager,[4] 353 fumigations performed in that city under the supervision of the sanitary bureau of the health department. In fact the New York regulations governing fumigations have been changed recently to provide for additional safeguards for the occupants of premises during and following fumigation.

4. Oberwager, John: Supervision of Fumigation and Extermination, Am. J. Pub. Health **28**: 633 (May) 1938.

Current Comment

THE ABORTIFACIENT AND OTHER EFFECTS OF THE URINE AND SERUM OF CANCEROUS PATIENTS

Elsasser and Wallace[1] recently reported that the urine and serum of patients with malignant tumors have a selective action on embryonal or newly growing tissue. The work began with the urine of a man with an embryonic cancer of the right testicle. Daily intravenous injections in pregnant rabbits of 20 cc. of urine produced abortion on the fifth day. The urine of patients with other tumors of embryonal nature—dysgerminoma of the ovary, teratoma of the testicle, Wilms tumor—produced abortion, as did "the urine of a large number of patients with other types of malignant tumors" (no further details are given). The blood serum of patients whose urine caused abortion also was effective. Control tests with the urine or serum of normal persons and of noncancerous ward patients gave negative results. Following the daily injections of urine from cancerous patients a progressive placental necrosis with infiltration of inflammatory cells occurred, with destruction of the embryo or expulsion in late pregnancy. In nonpregnant rabbits the injections of urine caused degeneration of the graafian follicles and sclerosis of the ovarian tissue; in male rabbits the injections caused degeneration of the spermatogenic processes. In rats with implanted carcinoma (Walker 256) injection of urine from cancer patients was followed by necrosis of the carcinomatous as well as of newly formed blood vessels. Here it should be noted that the urine of pregnant women did not cause abortion in rabbits and neither did massive doses of anterior pituitary-like preparation [2] together with estrogenic hormone. Many problems arise from these interesting results which call for further work along various lines. The results of such work will be awaited with keen interest. Whether the principle has been discovered of a test of value in the early diagnosis of any kind of cancer remains to be determined.

1. Elsasser, T. H., and Wallace, G. B.: A Selective Action of Urine and Serum from Patients with Malignant Tumors on Embryonal and Newly Growing Tissues, Science **89**: 250 (March 17) 1939.

RENAL CALCULI IN VITAMIN A DEFICIENCY

The occurrence of urinary calculi in rats fed on a diet deficient in the fat-soluble vitamins was first reported by Osborne, Mendel and Ferry.[1] Through numerous repetitions of this type of experiment the role of vitamin A in experimental urolithiasis has been recognized but the mechanism of stone formation under these conditions is not entirely clear. Thus the alkalinity of the urine excreted by rats on a vitamin A deficient diet has been related to stone formation by some investigators and the infection of the urinary tract resulting from vitamin A deficiency is believed to be an important contributory factor by others. A recent report of Steiner, Zuger and Kramer [2] on the production of renal and ureteral calculi in guinea pigs by feeding these animals a diet deficient in vitamin A is of particular interest as the alkalinity of the urine alone and infection of the urinary tract apparently did not have an important part in the development of the concretions. Large plaques of desquamated epithelial cells were found in the pelvis and ureters and it appears that these large plaques acted as niduses for the formation of calculi. There was no gross or microscopic evidence of infection in the urinary tract. The transformation of epithelial cells which has been recently dealt with by Wolbach [3] was observed. The vitamin A deficiency caused hyperplasia, later metaplasia to squamous epithelium, and finally atrophy of the pelvic and ureteral mucosa. The observations of Steiner and his collaborators do not minimize the importance of improper mineral balance of the food, presence of infections in the urinary tract and excessive alkalinity of the urine, other factors which may be involved in the genesis of urinary calculi as a result of faulty diet. The detailed description of the part played by small pieces of epithelium in the production of calculi in the guinea pig in these particular experiments sheds more light on the etiology of urolithiasis, a subject which long has needed clarification.

2. Antuitrin-S.

1. For references to the work in this field, see report of the Council on Pharmacy and Chemistry, Vitamin A and Urinary Lithiasis, THE JOURNAL, Dec. 14, 1935, p. 1983.

2. Steiner, Morris; Zuger, Bernard, and Kramer, Benjamin: Production of Renal Calculi in Guinea Pigs by Feeding Them a Diet Deficient in Vitamin A, Arch. Path. **27**: 104 (Jan.) 1939.

3. Wolbach, S. B.: The Pathologic Changes Resulting from Vitamin Deficiency, J. A. M. A. **108**: 7 (Jan. 2) 1937.

ORGANIZATION SECTION

THE WAGNER BILL

AN ANALYSIS OF THE WAGNER NATIONAL HEALTH BILL OF 1939

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Just a few weeks ago—on February 28, to be exact—the senior Senator from New York, Hon. Robert F. Wagner, introduced in Congress a measure of far-reaching importance to the people of the United States and particularly to the people of the South. This measure, known as the National Health Act of 1939, has been referred to the Senate Committee on Education and Labor and is now awaiting action by that committee and later by the two houses of Congress.

The chief purpose of this measure, as described in its preamble, is "to provide for the general welfare by enabling the several states to make more adequate provision for public health, prevention and control of disease, maternal and child health service, construction and maintenance of needed hospitals and health centers, care of the sick, disability insurance," and so on.

More specifically, the measure makes use of the sound procedure of grants-in-aid to the various states, which provides a wide latitude to the individual states in the development of their own health plans, conditioned by the particular health problems of greatest importance to their own people. Such grants-in-aid are provided for the purpose of establishing, expanding and improving state programs in the fields of child and maternal health, general public health services and investigations, construction of hospitals and health centers in communities where they are most needed, general medical care, and insurance against loss of wages and salaries during periods of temporary disability. Administration of the act, if it is passed in its present form, will become the responsibility of three already established federal agencies: the Children's Bureau, the United States Public Health Service and the Social Security Board. In discussing the bill at the time of its introduction, its sponsor declared that "the fullest development of this program would bring the benefits of modern medical science, both preventive and curative, within the reach of all groups of the population, especially in rural areas suffering from economic distress." In view of the fact that such a large percentage of the people of the South are residents of rural sections and the even more significant fact that they rank extremely low in per capita wealth, the National Health Act of 1939 promises to make available to the people of this state a degree of medical, nursing and hospital care never known in the past.

It has been pointed out that under no circumstances will the federal government undertake to furnish medical care. Administration in all cases, except of course in the matter of the necessary federal allocation of funds and insistence on states complying with the proper standards of performance, will be through the states, which will formulate their plans on the basis of local needs, conditions and problems. No attempt will be made to displace existing activities with new ones, although naturally these activities will be able, with additional funds, to expand and to operate much more effectively.

No system of health insurance is contemplated in the bill as a function of the federal government, nor is any participating state required to institute such a system. In that section of the measure dealing with a general program of medical care (title XIII) the states will be at complete liberty to develop, under the inspiration of local needs, conditions and problems, the types of medical care programs they peculiarly need, subject of course to the proviso that the programs devised must square with certain basic standards to be set by the three federal agencies that have been mentioned. The general program of medical care which a particular state may formulate as best for its own people may be limited, at the discretion of its officials, to persons on relief or, again at their discretion, it may be broadened to include those of nonrelief status. It may be financed entirely by insurance contributions, from tax funds or from both. The method and scope of medical services to be provided likewise are to be determined by the proper officials of the state concerned and, of course, these services may be provided by private agencies and institutions already in operation, if that is desired. Provision is wisely made for the training of personnel employed to provide these services, and such personnel must be selected on a merit basis.

An important aspect of the bill which should not be lost sight of is the absence of specific detail for operation incorporated into the basic law. Such specificities would have destroyed the autonomy of states in the effort of each to work out its own salvation in a yet uncharted field.

The act carries appropriations totaling approximately $80,000,000 for the first year, exclusive of such sums as Congress at its discretion may appropriate for aiding the states in the construction of needed tuberculosis sanatoriums and mental hospitals, with increases from year to year over a ten year period. Under its terms federal appropriations would be available for the matching of sums appropriated by the individual states as their share of the cost of their own health programs. The measure carries no authorization of new federal payroll taxes.

In order to accomplish one of the main purposes of the measure, namely the aiding of economically impoverished communities in their efforts to provide needed hospital, medical and nursing care, the measure stipulates that the federal funds appropriated to put it into effect are to be allocated to the several states on a variable matching basis, the amount to be received by a particular state depending on that state's relative financial resources, as determined by the per capita income of its

population. Thus the bill is intended by its sponsor and supporters to "raise the general level of health protection throughout the country, while reducing the existing wide variations among the states, and especially as between rural and urban areas."

In addition to the health services in the preventive and curative fields already mentioned, the bill provides grants-in-aid to the states to be used in setting up insurance plans by means of which cash benefits may be made available during periods of temporary disability. Such systems would be so devised as to provide the greatest possible protection to the American wage earner against wage loss resulting from such disability, which loss is estimated at more than a billion dollars a year. Thus systematic insurance payments would insure the continuance of workers' incomes through those periods when they are most needed.

The National Health Act of 1939 is not intended to transform the United States into a utopia in health matters overnight. However, it was framed and introduced in the hope and belief that it would bring the blessings of health protection to multiplied millions of our people whose need for such protection is no less great because as a result of their financial status they have not been able or, at best, have been only partially able, to finance it in the past.

BUREAU OF MEDICAL ECONOMICS

The article by Dr. J. N. Baker was submitted to the Bureau of Medical Economics of the American Medical Association, which submits the following comment:

The basic questions raised in connection with the Wagner bill are probably the following two: first, whether the proposed appropriations for the various purposes are suitable to the needs; second, whether the bill, by extending federal help or subsidies, is intended to encourage the establishment of sickness insurance systems by states.

This discussion appears to assume that the federal allocation of funds will actually be made "through the states, which will formulate their plans on the basis of local needs, conditions and problems."

It also states that "no system of health insurance is contemplated in the bill as a function of the federal government," which is probably a correct statement. But, if federal subsidies are to be used to encourage states to adopt such plans, then it is to that extent a sickness insurance bill providing for partial support by the federal government.

Is "the absence of specific detail for operation" in the basic law wholly desirable if the effect of the law is to subsidize plans the "specific detail" of which would be determined largely by the federal authorities?

BUREAU OF LEGAL MEDICINE AND LEGISLATION

Dr. Baker's statement was submitted also to the Bureau of Legal Medicine and Medical Legislation, which submits the following comment:

Dr. Baker's analysis is entitled to careful consideration not only because of his professional and official standing but also because it presents a view of Senator Wagner's proposed amendments to the Social Security Act that seems to be based largely on local considerations and on economic conditions that every one hopes are only temporary.

The bill introduced by Senator Wagner, S. 1620, is described in its title as "A Bill to provide for the general welfare by enabling the several States to make more adequate provision for public health, prevention and control of disease, maternal and child health services, construction and maintenance of needed hospitals and health centers, care of the sick, disability insurance, and training of personnel; to amend the Social Security Act; and for other purposes." Of this bill, Dr. Baker says:

> In view of the fact that such a large percentage of the people of the South are residents of rural sections and the even more significant fact that they rank extremely low in per capita wealth, the National Health Act of 1939 promises to make available to the people of this state [Alabama] a degree of medical, nursing and hospital care never known in the past.

To accomplish this result—

> . . . the measure makes use of the sound procedure of grants-in-aid to the various states, which provides a wide latitude to the individual states in the development of their own health plans, conditioned by the particular health problems of greatest importance to their own people.

The arguments advanced by Dr. Baker in support of the amendments to the Social Security Act, proposed by Senator Wagner, have a certain degree of validity. They must be weighed, however, in the light of his status as the health officer of a great state, but a state whose people happen just now to be in financial distress and in need of help. Speaking for the country over, one might reply to Dr. Baker's arguments along the following lines:

The term "grants-in-aid" implies that the federal government will pay to the several states, or to some of them, money to aid in carrying on certain intrastate activities. Such a grant, however, is generally made only on condition that the state appropriate state funds to help defray the cost of such activities and always on condition that it submit to certain conditions imposed by the federal government, including the supervision and control of the work by federal officers. Waiving all question as to the essential soundness of such federal grants, in a country such as ours, organized under a constitution carefully designed to preserve the rights of the several states from infringement by the federal government, a brief examination of the operation of such grants seems to show not only that the underlying principle is essentially unsound but also that, instead of enabling the several states to make more adequate provision for public health and such other activities described in the caption of the Wagner bill, they tend to limit the ability of many states to do so.

In the first place, we must ask where the federal government is to obtain the money wherewith to pay such grants-in-aid as are proposed in this bill. The federal government cannot create money and it must get it somewhere. It can get it only by taxation, and the ultimate consumer pays the price in the cost of living. Conceivably it might abandon governmental activities already under way and apply to the new projects proposed by Senator Wagner the money thus saved. On the other hand, it might and presumably will levy additional taxes if the bill should be enacted.

No proponent of the Wagner bill has even as much as suggested that any federal activity now under way be curtailed or abandoned to provide the funds necessary to pay the federal share of the expenses of the activities proposed by Senator Wagner. The abandonment of any such activity, however, would still leave the cost to be paid out of the taxes thereby rendered unnecessary and which might be discontinued but for the enactment

of this bill. It is generally assumed, however, that the money for the federal share of the expenses of the proposed activities will be provided by additional taxes, if the bill is enacted. As the bill now stands, it does not propose to levy additional taxes in the form of federal payroll taxes or specific taxes of any kind, having direct reference to the expenses of this legislation; for any proposal to levy taxes for that specific purpose would bring to the attention of the taxpayers of the country the cost of the pending bill and probably insure its defeat. The needed money, therefore, must presumably be raised by increasing the rates at which some of our existing taxes are levied or by imposing new general taxes of some kind, and the taxpayer, even though he may complain of the increase in taxation, will not be able to associate the increase with the cost of this bill. And the primary taxpayer—that is, the taxpayer who pays the money directly into the federal treasury—will whenever he can pass the tax along and sooner or later it will rest on the back of the ultimate consumer, whose ability to maintain himself and his dependents will be decreased in proportion to the increase in taxation.

But that is not all. Grants-in-aid given by the federal government will generally have to be matched wholly or in part by money provided by the several states to which such grants are made. The state accepting a grant-in-aid will find itself, therefore, in the same position as that of the federal government; it will have to curtail or discontinue present activities and public benefits in order to obtain the money wherewith to meet the federal grant or else will have to increase state taxes. If the state activities curtailed or discontinued are essential to the public welfare, the public will suffer. If new taxes are imposed or the rates of taxation with respect to old taxes increased, the increase in the tax burden will reach the ultimate consumer, with corresponding further increase in his cost of living and with further diminution in his ability to provide support for himself and his dependents.

There is another aspect of the grant-in-aid system such as Senator Wagner's bill proposes that is seldom recognized. Even though it may enable some states to make more adequate provision for projects covered by the act, it lessens the ability of other states to do so. With respect to states in the latter class, so-called grants-in-aid are not "in-aid" but are only the return by the federal government to the state of money taken from its people through federal taxation, directly or indirectly, and even that return is made only on condition that the state submit to the determination by the federal government as to the purposes for which it shall be spent and federal supervision and control of the state agencies employed to accomplish those purposes. The amount returned to a state in this category is less than the amount taken from it by the federal taxation and is equal to only the remainder of the federal taxes collected from the people of the state, after the federal government has deducted such amounts as it deems necessary to provide federal subsidies for other states. To the extent that the grant-in-aid payable to any state is less than the money collected from the people of the state by the federal government for the purpose of providing such federal subsidies in general, the ability of that state to provide for its own people is diminished.

If the distribution of federal grants-in-aid was made according to the actual necessities of the several states, as determined by a fair and open study of the situation, there could be little or no objection to them. No one would object to the making of grants of public money to relieve distress in any state that the state itself was financially unable to relieve, but the idea of making such grants even to the richest and most prosperous states in the Union is hardly compatible with the hypothesis on which the making of such grants is popularly believed to be based. Appropriations have been made by the federal government without criticism or complaint for the direct relief of suffering even in foreign countries, and certainly no criticism has been or will be voiced in making appropriations for such relief in this country. But when the federal government levies taxes on persons in states not in need, in excess of the requirements of the states that are in need, and then returns the excess thus collected to the state from which it was collected but only on condition that the state subject certain intrastate affairs to the supervision and control by some federal appointive officer, the entire plan savors strongly of an effort to concentrate power in Washington at the expense of the states.

Dr. Baker points out that the pending Wagner bill to amend the Social Security Act, if enacted, will make available to the people of Alabama a degree of medical, nursing and hospital care never known in the past. If there is actual need for a degree of medical, nursing and hospital care in Alabama that has never been known in the past, and if the state of Alabama is unable to provide it, by all means let it be provided. But even if such a need is shown in Alabama and in some other states, but not in all, that fact does not justify imposing on all states the system of federally subsidized and controlled relief that may be necessary in Alabama and other states similarly situated. Certainly some states are able to look after their own people, without federal grants-in-aid and federal supervision and control. It may be claimed, of course, that the federal government must deal with every state on an equal footing, although there is no such requirement in the constitution; but, as has already been pointed out, grants-in-aid such as are proposed by the Wagner bill do not operate uniformly on all states. They place all states equally under federal supervision and control, it is true, but they result in the taking of money from the people of some states for distribution among the people of other states, thus lessening the financial resources of the states from which the money was taken in the first instance for the benefit of other states. The plan seems to be devised for the redistribution of wealth among the states. How far it may go toward promoting a spirit of complaisant dependence among the states, no one can foretell.

Dr. Baker emphasizes the fact that—

> No system of health insurance is contemplated in the bill as a function of the federal government, nor is any participating state required to institute such a system. . . . The general program of medical care which a particular state may formulate as best for its own people may be limited, at the discretion of its officials, to persons on relief or, again at their discretion, it may be broadened to include those of nonrelief status. It may be financed entirely by insurance contributions, from tax funds or from both. . . .
>
> In addition to the health services in the preventive and curative fields already mentioned, the bill provides grants-in-aid to the states to be used in setting up insurance plans by means of which cash benefits may be made available during periods of temporary disability.

While Dr. Baker's statement concerning health insurance is strictly correct, it hardly gives a true picture of the purpose and effect of the bill so far as health insurance is concerned.

The bill authorizes appropriations for grants to states for medical care amounting to $35,000,000 and of $10,000,000 for temporary disability compensation for the fiscal year ending June 30, 1940, and for unlimited appropriations thereafter. To obtain grants from the appropriation for medical care, a state must have submitted to the Social Security Board state plans satisfactory to that board, extending and improving medical care. Nothing in the bill limits this proposed medical care to indigent persons or even to persons of moderate means. Nothing in the bill defines the particular type of medical service that is to be provided. The Social Security Board seems to be at liberty to refuse to approve any state system that does not meet its ideas of social economics. It may refuse to approve any proposed system unless it provides for the distribution of medical service by a salaried state staff. It may refuse to approve any system that does not provide for medical service with free choice of physicians, paid on a fee basis. On the other hand, it may refuse to approve any system that is not based on strictly insurance principles, even with state payroll taxes and the usual accompaniments of health insurance. Any such system may possibly be styled a "state" system, but in order to obtain the federal subsidy it must have the approval of federal officers and in last analysis such a system is a "federal" system or at most a "federal-state" system.

Dr. Baker's statement that the insurance plans proposed in the Wagner bill to provide temporary disability compensation for persons temporarily disabled by illness or injury provide for cash benefits is incomplete, for the bill expressly provides that the Social Security Board "shall not approve the plan of any State which does not have a plan or plans approved under this Act under which the Board finds that reasonably adequate medical services, including preventive services, are available to minimize disability among those covered under the State plan for temporary disability compensation." This necessarily implies the setting up by the state of a medical service of some kind to care for persons who are temporarily disabled and who are entitled to the benefits under the state plan. Nothing in the bill limits the beneficiaries of a state system of disability compensation to employed or even to employable persons. In fact, the bill expressly provides that disability, to be compensable, shall not have arisen out of or in the course of employment. Here certainly we have the germ of a full-fledged system of health insurance. When considered in connection with the provisions of the bill that authorize federal subsidies for state systems of medical care (which is defined to include all services and supplies necessary for the prevention, diagnosis and treatment of illness and disability) the provisions relating to disability compensation seem to leave the entire matter of health insurance throughout the entire United States to the judgment of the Social Security Board rather than to Congress, where it belongs.

Nothing in what is here written is intended in any way to reflect on the officers who are now charged with administering federal laws authorizing federal grants-in-aid, but officers come and officers go, and what an officer feels today with respect to governmental operations in the field of social economics and the administration of state aid is not necessarily what another officer will feel tomorrow. As a matter of fact, the people of the country have the right to have such matters determined by law and not by the mere judgment of individual federal executive officers.

GRADUATE MEDICAL EDUCATION

A PROGRESS REPORT OF THE FIELD STUDY ON GRADUATE MEDICAL EDUCATION IN THE UNITED STATES BEING CONDUCTED BY THE COUNCIL ON MEDICAL EDUCATION AND HOSPITALS

LOUISIANA

In August 1936 a conference was held between representatives of the Louisiana State Medical Society and the Louisiana State Board of Health to outline a graduate program in obstetrics and pediatrics for physicians practicing throughout the state. It was proposed that the state society's committee on postgraduate education, which consists of five members with Dr. J. S. Kopfler as chairman, would act as the executive agency. On this committee is a member of the committee on maternal welfare and a member of the committee on medical education of the state medical society, together with the director of the Division of Maternal Child Health of the Louisiana State Board of Health. The professors of obstetrics in the two medical schools in the state outlined the educational program in obstetrics, and the professors in pediatrics actively participated in organizing the instruction in their special field. The expense of these courses was met with federal funds allocated to the state board of health.

Each course consists of five two hour sessions during one week. Teaching centers were selected in each of the eight councilor districts of the state. The district committee of from three to five physicians, including the district councilor, has charge of local arrangements and publicizes and assumes responsibility for the success of the graduate program in each district. Announcements are mailed to all physicians in the parishes of the district, and notices are published in the *New Orleans Medical and Surgical Journal*. The course as outlined includes lectures illustrated with movies, round table conferences, consultations on request and manikin demonstrations. Two in state lecturers are chosen for each locality by the state society's committee, one an obstetrician and one a pediatrician. Lecturers receive $25 a day, plus traveling expenses. Attendance records are kept by a member of the local committee. There is no registration fee.

From October to December 1936 instruction in obstetrics was given in nine towns. From twenty to forty physicians in each section attended. The auditorium of the city hall or the court house was used as a meeting place.

From December 1937 to December 1938 courses were given in obstetrics in ten towns and in pediatrics in fourteen towns in eighteen parishes of the state. Ten obstetricians and ten pediatricians have constituted the faculty. Two hundred and seventy-five physicians have attended the obstetric meetings and 407 have attended the sessions in pediatrics. Obstetric clinics have been held in six places where patients could be obtained for teaching. Six other parishes have selected pediatric courses, and it is planned that the state will be covered by the early part of 1939. All physicians of Louisiana have had an opportunity to avail themselves of this training. There are 1,324 members of the state medical society of the 2,200 physicians practicing in the state.

The Tulane University of Louisiana School of Medicine Department of Graduate Medical Studies was reorganized and its activities expanded in June 1937. All graduate medical education is now conducted under the supervision of the director of medical studies, Dr. H. W. Kostmayer. The faculty includes members of several departments of the school of medicine, and the facilities of the school are available to graduates who enroll

for study. The department has a budget, part of which provides instructors with compensation for the special intensive courses they give to graduates. Expenses of administration are charged against the graduate department's budget, but the use of the school's teaching facilities otherwise is not charged against this department.

The division of medical extension was created in 1937 and a full time assistant professor in the medical school was appointed as director. The medical extension division was organized for the purpose of conveying graduate instruction to those physicians who are unable to engage in formal study in medical centers. This division is supported largely by the Commonwealth Fund of New York, while Tulane University, the Mississippi State Medical Association and the Mississippi State Board of Health together provide approximately one fourth of the total budget. Fees from practicing physicians added an additional 5 per cent during the first year. Slightly more than half of the total expense during that year was allotted to administration and the remainder to instruction, including the travel expenses of instructors.

As now organized, the department of graduate medical studies offers several types of instruction to medical graduates: (1) a program for those who register in the graduate school of the university for advanced study in clinical divisions leading to advanced degrees after two or three years of residence; (2) fellowships in courses of study of one or more year's duration not leading to a degree—such courses are adaptable to the requirements of the specialty boards and may include instruction in the basic sciences; and (3) short, intensive courses in restricted fields such as cardiology, urology and dog and cadaver surgery. Applicants for these courses must have some preliminary training.

Intramural review courses designed for practicing physicians cover the general fields of medicine, surgery, gynecology and obstetrics. Instruction begins each January and continues for two periods of six weeks each, the second being a continuation of the lectures, clinics and demonstrations given in the first period. In these courses most of the morning instruction is given at the bedside of patients, although graduate students have no case responsibilities. The schedule provides for general review courses, one in medicine, one in surgery, including orthopedics and urology, one in gynecology and obstetrics and one in routine laboratory procedure. The latter includes clinical microscopy and requires about two hours each day. The fee for the first six weeks' course is $100 and for the succeeding six weeks $50. No diploma-like certificate is issued. Attendance averages from twenty-five to thirty physicians in medicine, from fifteen to twenty in surgery and from twelve to fourteen in gynecology and obstetrics.

An annual clinical conference of one week's duration is held each fall at the medical school, for which a fee of $5 is charged. One hundred and twenty-two registered last session. Other special review courses are available to medical graduates. The total registration for intramural courses in 1937-1938 was 212.

The activities of the division of medical extension in Mississippi have been reported previously.[1] The division acts as the organizing and disbursing agency in Mississippi's statewide program and cooperates with the medical, health and hospital organizations of the state. A course in syphilology and dermatology now in progress utilizes two instructors from the medical school. A six lecture course in minor surgery is to begin in January 1939 with four instructors from the medical school as speakers. Instruction is largely didactic, although clinical material is used whenever available.

A similar extension program in internal medicine starts in April 1939 in Alabama under the joint auspices of the Medical Association of the State of Alabama, the Alabama State Department of Health and the division of medical extension. Circuits of five towns are planned with the instructor visiting each teaching center one day a week for seven times. Approximately twenty or twenty-two centers will be established during the first year. A field organizer will precede the instructor and with the cooperation of the medical association's committee on postgraduate study will obtain the cooperation of local medical societies. A registration fee of $5 will be charged, but since the instructional expense will exceed the amount of this fee donations from the medical and health organizations in Alabama and the Commonwealth Fund of New York will be utilized.

The Graduate School of Medicine of Louisiana State University Medical Center was organized in 1936 when Dr. James T. Nix was appointed dean. The faculty and facilities of the medical center are at the disposal of the graduate school. Three types of intramural instruction have been offered: (1) general review courses designed for practicing physicians, (2) review courses in medicine and in the medical specialties and (3) review courses in surgery and the surgical specialties. In January and February 1938 eight such courses were offered for periods of from two to six weeks. A fee of $100 a month is charged nonresidents of the state for scheduled short review courses, while residents of Louisiana are charged one-half this amount. In addition, personal courses are arranged according to the needs of individual physicians.

Extramural instruction is being given throughout Louisiana in the form of seminars by groups of the faculty of the graduate school of medicine in cooperation with the general extension division of Louisiana State University. The first of these was held at the Lafayette Charity Hospital, Lafayette, La., Dec. 2 and 3, 1938. Twelve members of the faculty participated in the afternoon and evening meetings, which included a clinical pathologic conference. A registration fee of $1 was charged. More than 100 physicians attended. Similar programs designed for practicing physicians are projected in charity hospitals in three other towns of the state.

A special course in diagnosis, treatment and control of the venereal diseases was given at the medical center of Louisiana State University in cooperation with the United States Public Health Service, the Louisiana State Board of Health and the Department of Public Welfare of the City of New Orleans for a period of six weeks beginning Nov. 15, 1938. The attendance was limited to twelve physicians. Didactic instruction with clinical and laboratory experience, conferences and field studies was included.

The Louisiana State University Medical Library offers practicing physicians of the state a library service which includes the compilation of bibliographies. The only charge made is for postage on packages lent by the library.

The New Orleans Graduate Medical Assembly was organized in 1937 by a group of 150 physicians of the Orleans Parish Medical Society. These New Orleans physicians guaranteed the success of the four day assembly, which is held during February or March of each year. Lectures, dry clinics and round table discussions are conducted in a local hotel by eighteen out of state speakers. Louisiana physicians participate also, especially in the scientific exhibits. A registration fee of $10 is charged, while commercial exhibits aid in paying the travel expenses of speakers. Announcements are sent to physicians in thirteen Southern states and notices appear in state medical journals. In 1937, 632 physicians registered, 474 from Louisiana, with nineteen states and the District of Columbia being represented. In 1938, 610 physicians registered, 529 from Louisiana and the remainder from twenty other states.

1. Graduate Medical Education: Mississippi, J. A. M. A. **110:** 226B (May 28) 1938.

A Feat of Giant Memory.—Diagnostic knowledge and ability is the first essential of good practice; it therefore becomes in teaching hospitals the most direct and universal measure of medical learning; it is the stepping-stone to personal success. Its highly competitive character is mainly responsible for the atmosphere of intenseness in these institutions. . . . But, from our present standpoint, it lends an exaggerated importance to knowledge of numerous rare diseases, of newly described phenomena of minor interest, and of newly described methods and tests. A desire for encyclopedic knowledge is fostered and grows; it moves in the direction of detail, for the phenomena studied are of great complexity and diversity, and present few of those connecting links in the form of principle or generalization that would serve to lighten what otherwise becomes a feat of giant memory. The result of this system is the loss of much that is of value in the earlier training.—Lewis, Sir Thomas: Research in Medicine and Other Addresses, London, H. K. Lewis & Co., Ltd., 1939.

OFFICIAL NOTES

RADIO BROADCASTS

The radio broadcasts by the American Medical Association and the National Broadcasting Company, under the title Your Health, continue as previously announced each Wednesday over the Blue network of the National Broadcasting Company at 2 p. m. eastern standard time (1 p. m. central standard time, 12 o'clock mountain time, 11 a. m. Pacific time).

Starting April 30, daylight saving time takes effect in Chicago. The program will therefore be broadcast at the same hour Chicago daylight saving time, which means one hour earlier central standard time, two hours earlier mountain time and three hours earlier Pacific time. In communities where daylight saving time is in effect there will be no change in the hour of the broadcast.

Owing to network conflicts the Chicago broadcast does not occur at 1 o'clock Wednesday but there is a rebroadcast from a recording over station WENR at 8 o'clock each Monday evening, on and after May 1 (8 o'clock Chicago daylight saving time, 7 o'clock central standard time). The program broadcast each Monday is identical with the network program of the preceding Wednesday.

It has been necessary to curtail the length of the series by omitting the last two programs, which would have been broadcast June 14 and June 21. The series, therefore, will end with the broadcast scheduled for June 7.

The next three programs to be broadcast, together with their dates and their topics, are as follows:

April 26. What Is a Doctor?
May 3. Healthier Mothers.
May 10. The Doctor's Workshop.

THE ST. LOUIS SESSION

Special Radio Programs

Radio programs have been arranged in connection with the annual session of the American Medical Association in St. Louis.

Dr. Irvin Abell, President of the Association, will broadcast over the Blue network of the National Broadcasting Company, Monday, May 15, from 4:15 to 4:30 p. m. central standard time. Dr. Rock Sleyster, President-Elect, will broadcast over the Columbia Broadcasting System, Monday, May 15, from 3:45 to 4 p. m.

Dr. W. W. Bauer, Director of the Bureau of Health Education of the American Medical Association, will broadcast over the Blue network of the National Broadcasting Company Friday, May 19, from 4:15 to 4:30.

MEDICAL LEGISLATION

MEDICAL BILLS IN CONGRESS

Changes in Status.—S. 1899 has passed the Senate, providing for the detail of a commissioned medical officer to serve as assistant to the Surgeon General of the United States Public Health Service. S. 1582 has passed the Senate, proposing to authorize the President to bestow a Meritorious Service Medal on any civil officer or employee of the United States, including commissioned officers of the Public Health Service, for the performance of an outstanding act or service involving great physical bravery or heroism, or for the performance of a service to the government or to humanity characterized by exceptional merit and involving a high degree of labor or effort above and beyond the ordinary and usual requirements of his office.

Bills Introduced.—S. 1744, introduced by Senator Reynolds, North Carolina, proposes to direct the Secretary of the Treasury to pay to Bernarr Macfadden the sum of $2,000 together with interest at the rate of 6 per cent per annum from Nov. 11, 1907, in full satisfaction of his claim against the United States for a refund of the fine paid by him as the result of his conviction on Oct. 22, 1907, in a United States district court for mailing certain issues of the magazine entitled *Physical Culture*, which contained "certain allegedly obscene matter." S. 1964, introduced by Senator Wagner, New York, proposes to authorize national banking associations to contribute to community funds or to charitable, philanthropic or benevolent instrumentalities conducive to public welfare such sums as its board of directors may deem expedient and in the interests of the association. H. R. 4923, introduced by Representative Geyer, California, proposes to provide for the forfeiture and seizure of matter sent through the mails relating to contraception, abortion or matter designed, adapted or intended for any indecent or immoral use. H. R. 5272, introduced by Representative Dunn, Pennsylvania, proposes to amend the Social Security Act so as to enable each state to adopt its own interpretation of the phrase "needy individuals who are blind" as used in the act. H. R. 5284, introduced by Representative Merritt, New York, proposes to authorize an appropriation of $1,875,000 to construct a 600 bed capacity veterans' hospital to accommodate general medical and surgical patients. H. R. 5379, introduced by Representative Smith, Ohio, proposes to amend the Federal Food, Drug and Cosmetic Act so as to relieve from certain of the labeling requirements of the act any "drug dispensed by a physician for the treatment of asthma and hay fever where such drug shall have been exclusively dispensed by physicians for at least ten years prior to June 25, 1939." S. 2093 and S. 2140, both introduced by Senator Bone, Washington, propose to permit federal income taxpayers to deduct in connection with their income taxes amounts not in excess of $250 paid during the taxable year for medical, dental, surgical or nursing treatment or hospitalization. H. R. 5134, introduced by Representative Dunn, Pennsylvania, proposes to amend the Social Security Act so as to authorize assistance to blind individuals whether or not the state plan extends only to those blind individuals whom the Social Security Board considers to be needy. H. R. 5475, introduced by Representative Gehrmann, Wisconsin, proposes to prohibit the importation of dairy products produced from milk or cream other than from cows either accredited free of bovine tuberculosis and Bang's disease or under test for such diseases. H. R. 5519, introduced by Representative Anderson, Missouri, proposes to confer certain benefits on commissioned officers and enlisted men in the Army, Navy, Marine Corps, Coast Guard, Geodetic Survey or Public Health Service of the United States who are placed on the retired list for physical disability incident to flying duty. H. R. 5577, introduced by Representative Izac, California, proposes to authorize an appropriation of $950,000 to construct and equip a marine hospital at San Diego. H. R. 5630, introduced by Representative Lea, California, proposes to amend the Federal Food, Drug and Cosmetic Act so as to postpone from June 25, 1939, to Jan. 1, 1940, the effective date of certain of its provisions that have not already gone into effect and of the regulations promulgated thereunder. The provisions of the act to be affected by the pending bill if it should be enacted relate for the most part to labeling requirements for foods, drugs, devices and cosmetics and the use of coal-tar dyes in foods, drugs and cosmetics. The bill also proposes to amend chapter V, section 502 (d) of the act so as to require the labels of drugs containing any narcotic or hypnotic substances to state only the "name and quantity or proportion" rather than the "name, quantity, and percentage" of such substances. H. R. 5657, introduced by Representative Sheppard, California, proposes to provide that any person who served in the military or naval forces of the United States during any war or during any recognized campaign or expedition, and who was not dishonorably separated from such service, shall be granted hos-

pitalization and domiciliary care by the Veterans' Administration, subject to the same restrictions and limitations as are now applicable to World War veterans. H. R. 5689, introduced by Representative Welch, California, proposes, among other things, to provide for the registry of surgeons as staff officers on vessels of the United States. H. R. 5736, introduced by Representative Voorhis, California, proposes to amend the Social Security Act so as to authorize an appropriation of $250,000,000 for the fiscal year ending June 30, 1940, and thereafter each year such sum as may be necessary to enable the states to grant assistance to needy persons who are not eligible for assistance under old-age, dependent children and aid to the blind provisions of the Social Security Act.

DISTRICT OF COLUMBIA

Bills Introduced.—S. 2013, introduced by Senator Capper, Kansas, proposes to amend the Code of the District of Columbia to provide for the organization and regulation of cooperative associations. The bill provides, in part: "In the case of an association formed hereunder which arranges the rendering to its members, of licensed professional services on a nonprofit basis, said association shall not be subject to the insurance laws, shall not be construed as being in violation of any rule against corporate practice of professions, or in violation of statutes regulating licensure of professions." S. 2066, introduced by Senator Reynolds, North Carolina, proposes to provide for the use of scientific tests to determine the degree of intoxication of operators of motor vehicles in the District of Columbia whose vehicle causes personal injury or substantial damage to any other vehicle or property. H. R. 5673, introduced by Representative Bates, Kentucky, proposes to provide that the physicians assigned to Gallinger Municipal Hospital in the District of Columbia and known as chief resident physicians shall be designated and known as chief medical officers.

STATE MEDICAL LEGISLATION

Delaware

Bills Introduced.—Senate Substitute for S. 177, to amend the workmen's compensation act, proposes to increase to $300 from $150 the maximum liability of an employer for surgical, medical and hospital services which he must furnish an injured workman. Senate Substitute for S. 253 proposes to grant to physicians, nurses and hospitals treating persons injured through the negligence of others liens on all rights of action, claims, judgments, compromises or settlements accruing to the injured persons by reason of their injuries.

Florida

Bills Introduced.—S. 35 proposes to require all applicants for licenses to practice the healing art, as a condition precedent to their examination or licensure by their respective professional boards, to pass examinations in anatomy, physiology, chemistry, pathology and bacteriology, to be given by a board of examiners in the basic sciences, each of whose members must be learned in the basic sciences named and be a member of the faculty of a university or college in the state having a four year college course. S. 65 was reported favorably to the senate April 11, proposing to enact a new optometry practice act and to establish a state board of optometry to examine and license persons desiring to practice optometry. The bill proposes to define optometry as "the diagnosis of the human eye and its appendages, and the employment of any objective or subjective means or methods for the purpose of determining the refractive powers of the human eyes, or any visual, muscular, neurological or anatomic anomalies of the human eyes and their appendages, and the prescribing and employment of lenses, prisms, frames, mountings, orthoptic exercises, light frequencies and any other means for the correction, remedy or relief of any insufficiencies or abnormal conditions of the human eyes and their appendages." If the bill were enacted in its present form it might be unlawful for a licensed physician to perform any of the acts embraced in the above definition of optometry unless he were also licensed by the optometry board. S. 73 and H. 247 propose to prohibit the retail sale or distribution, except on the written prescription of a licensed physician, of amytal, luminal, veronal, barbital, acid diethylbarbituric or any trade marked or copyrighted preparation or compound registered in the United States Patent Office containing more than 4 grains to the avoirdupois or fluid ounce of these substances. H. 13 proposes to appropriate $10,000 annually to the State Board of Health for the purchase and distribution of insulin to residents suffering from diabetes or kindred diseases and who are financially unable to purchase the drug. H. 197 proposes to levy an annual state license tax of $10 on every person engaged in the practice of any profession. The bill further proposes to levy in addition a county license tax of $5. The bill also proposes to authorize incorporated cities and towns to impose such further license taxes as they deem proper provided the license tax so imposed does not exceed $5. H. 204 was favorably reported to the house April 12, proposing to authorize every licensed physician to compound and fill prescriptions written by him in his practice from a drug store or apothecary shop owned and operated by the physician.

Illinois

Bills Introduced.—H. 506 proposes that no person licensed under the medical practice act shall be permitted or compelled to testify without the consent of his patient, in any civil action, concerning any information acquired in attending the patient, which was necessary to enable him to prescribe or act for the patient. H. 612, to amend the medical practice act, proposes to limit licensure in the healing art to citizens of the United States. H. 616 proposes to authorize the issuance of a divorce if either spouse is incurably insane and has been so continuously for five years immediately preceding the filing of the complaint for divorce.

Maine

Bill Enacted.—H. 1433 was approved by the governor March 30, authorizing the formation of nonprofit hospital service corporations to enter into contracts with subscribers for the rendering of hospital service to them through hospitals contracting to do so with the corporations in question.

Bill Introduced.—H. 2230 proposes to require a physician attending a pregnant woman to take or cause to be taken a sample of her blood and to submit that sample for a standard serologic test for syphilis to a laboratory of the state department of health and welfare or to a laboratory approved by the department.

Michigan

Bills Introduced.—S. 269 proposes to enact a separate naturopathic practice act and to establish a board of examiners in naturopathy to examine and license persons to practice naturopathy. The bill provides that "for the purpose of this act naturopathy is defined to include mechanotherapy, of every articulation of the human body but not to adjust any articular subluxation of the spinal column, corrective and orthopedic gymnastics, psychotherapy, hydrotherapy and mineral baths, electrotherapy, thermotherapy, phototherapy, chromotherapy, vibrotherapy, thalmotherapy, dietetics which shall consist of and include the use of foods and such biochemical tissue-building products and cell-salts, organic and inorganic, as are found in the normal body, and the use of vegetable oils and dehydrated and pulverized fruits, flowers, seeds, barks, roots, herbs and vegetables, uncompounded and in their natural state." The bill also proposes to make it unlawful for a licentiate to use any title other than the title "doctor of naturopathy." S. 317 proposes to regulate the manufacturing, producing, sale and distribution of drugs, cosmetics and medical supplies and to enact a new pharmacy practice act. S. 318, to amend the narcotic drug act, proposes, among other things, to permit a physician to cause narcotic drugs to be administered by a nurse or intern under his direction. The present law provides that he may cause such drugs to be administered by a nurse or intern under his direction *and supervision.* S. 319 proposes to regulate the manufacture, sale and advertising of foods, drugs, cosmetics and devices. H. 386 proposes to authorize the organization of corporations to operate voluntary nonprofit osteopathic care plans "whereby osteopathic care is provided at the expense of such corporation to such persons or groups of persons as shall become subscribers to such plan, under contracts which will entitle each such subscriber to definite health *and surgical care* and supplies, by licensed and registered doctors of the osteopathic school of medicine in their office, in

hospitals, and in the home." As noted, this bill proposes to permit osteopaths to render "surgical care." It is extremely doubtful whether the licenses granted osteopaths by virtue of the present osteopathic practice act permits such licentiates to practice surgery.

Minnesota

Bills Introduced.—S. 1262 proposes to prohibit the retail sale or distribution of devices, appliances, drugs or medicinal agents used for the prevention of venereal disease except by licensed physicians and persons licensed by the State Board of Pharmacy to do so. S. 1289 and H. 1454 propose a procedure whereby hospitals not operated for profit and registered with the State Department of Health may be reimbursed for care and treatment rendered indigents injured in motor vehicle accidents. H. 1367 and S. 1248 propose to authorize the organization of corporations to operate not for profit hospital service plans whereby hospital service may be provided by a hospital or hospitals, with whom such corporations have contracted, to those persons who become subscribers to such plans under contracts which entitle each subscriber to stated hospital care.

Missouri

Bills Introduced.—S. 348, to supplement the osteopathic practice act, proposes that in the administration of any public health project within the state, whether conducted with state funds or with funds furnished by the United States government to be expended by any Missouri agency, "all doctors of medicine and doctors of osteopathy must be accorded equal rights and privileges." H. 692 proposes as a condition precedent to the issuance of a license to marry that both parties to the proposed marriage present the certificate of a licensed physician that he or she is free from venereal disease in a communicable stage.

Nebraska

Bill Introduced.—Bill 507 proposes to authorize the organization of corporations not for profit to operate nonprofit hospital service plans whereby hospital service may be provided by such corporations or by hospitals with whom they have contracted to persons who become subscribers under contracts with the corporations. Hospital service to be provided by such a corporation is to consist of hospital care, including board and room, general nursing care, use of operating room, and routine laboratory services.

New Jersey

Bills Introduced.—S. 318 proposes that the law making it a misdemeanor to inflict unnecessary cruelty on a living animal shall not be construed to prohibit or interfere with properly conducted scientific experiments performed under the authority of the State Department of Health. The present law apparently limits the institutions or societies which the department may authorize to conduct such experiments by stating that the department may authorize such experiments to be conducted by agricultural stations and schools maintained by the state or federal government or by medical societies, universities, colleges and philanthropic institutions incorporated or authorized to do business in the state and having among their corporate purposes investigation into the causes, nature, prevention and cure of diseases. A. 296 proposes extensive amendments to the existing medical practice act. Among other things, the bill proposes to authorize the issuance of licenses to naturopaths and to provide that two members of the board of medical examiners must be naturopaths. The bill also proposes that persons licensed to practice osteopathy prior to May 23, 1935, may continue to practice osteopathy "as herein defined," defining the practice of osteopathy to "include the diagnosing, treating, operating or prescribing for any human disease, pain, injury, deformity, mental or physical condition; *provided, however,* that a license to practice osteopathy shall not permit the holder thereof to prescribe, administer or dispense drugs for internal use in the treatment of any human ailment, disease, pain, injury, deformity, mental or physical condition or to perform such surgical operations as require cutting." The bill also proposes to redefine the practice of chiropractic to "include the diagnosing, treating, dietary and hygienic control, and the detecting and adjusting, by hand of vertebral subluxations for the relief of pain and disease; *provided, however,* that a license to practice chiropractic shall not entitle the holder to perform surgery or administer drugs." The bill proposes also to require applicants for a license to practice any form of the healing art to present evidence, among other things, of having completed an internship acceptable to the board for at least one year in a hospital approved by the board or in lieu thereof to have completed one year of postgraduate work acceptable to the board except that naturopaths and chiropractors may serve internships in professional schools or clinics approved by members of the board of examiners who are osteopaths, chiropractors and naturopaths. A. 459 proposes to enact a separate chiropractic practice act and to establish a board of chiropractic examiners to examine and license persons to practice chiropractic. The bill proposes to define "chiropractic" as "The science of diagnosing, locating and correcting interference with nerve transmission and expression. The license to practice chiropractic shall include diagnosing, treating and prescribing for any human disease, pain, injury, deformity, mental or physical condition; provided, however, that a license to practice chiropractic shall not permit the holder thereof to prescribe, administer, or dispense drugs in the treatment of any human ailment, disease, pain, injury, deformity, mental or physical condition or to perform such surgical operations as require cutting."

New York

Bills Introduced.—A. 2251 and S. 1786 propose to require the state to reimburse a county 75 per cent of the total expended by it in extending "physical repair" to physically handicapped adult unemployed persons. The bills define "physical repair" as "the substantial correction or cure, by surgical or medical treatment and care, or by hospitalization, or by use of approved apparatus or device, of physical defects or physical disabilities of physically handicapped adult unemployed persons in such manner and to such extent as reasonably may be expected to fit them for remunerative occupation or employment." The bills then impose on the counties or other political subdivisions the duty of supplying such "physical repair" to the individuals noted. A. 2252 and A. 2241 propose a system of compulsory and voluntary health insurance, whose benefits are to consist of all forms of medical, dental and hospital services. All employees, excepting only persons employed at other than manual labor and receiving wages in excess of $2,500 a year, are to be subject to the compulsory insurance of the bill. All other persons are eligible to accept the voluntary insurance offered by them. S. 1776 and A. 2243 propose to create a temporary commission to survey the existence and prevalence of hay fever in the state, to devise ways and means for its prevention and elimination and to recommend methods for the treatment, relief and cure of persons suffering from hay fever. The bill proposes to appropriate $10,000 to defray the expense of the commission. A. 2242 proposes to prohibit the employment as a domestic servant of any person who does not possess a physician's certificate, executed after a physical examination and a standard serologic test for syphilis, that the person named is not infected with syphilis, or, if infected, is not in a stage of that disease whereby it may become communicable. In effect, the bill proposes to require such servants to submit to the examination stated annually. S. 1719 proposes to recodify the insurance laws of the state. It includes an article IX-C, which will permit the organization of nonprofit corporations either (1) to furnish medical expense indemnity or (2) to operate hospital service plans to persons who become subscribers under contracts with such corporations. Medical expense indemnity is to consist of reimbursement for medical care provided through duly licensed physicians, for nursing service and for furnishing necessary appliances, medicines and supplies. Each such plan must be open to the participation of duly licensed physicians without discrimination against schools of medical practice. S. 1627 and A. 2082 propose to extend to March 15, 1940, the life of the committee authorized by chapter 682, Laws, 1938, to investigate the health requirements of the people and to recommend such health insurance proposals or proposals with respect to state medicine as it deems advisable. A. 2107 proposes, in effect, to permit each recipient of relief to select the physician or dentist he desires to treat him at state expense.

Oklahoma

Bills Introduced.—H. 519, to amend the medical practice act, proposes (1) to require representation on the board of medical examiners for regular, eclectic and homeopathic physicians,

omitting the provision in the present law which requires one member of the board to be a physio-medic physician; (2) to provide that "the employment of what is commonly known as 'cappers' or 'steerers' in procuring practice" shall be cause for the revocation or suspension of a license "Provided that the term 'Cappers' or 'Steerers' shall not be construed to apply to: Bona fide Agents of Hospitals and Clinics legally organized. Provided further that such hospitals or clinics shall not be permitted to enter into contracts for hospital or medical services to be performed within thirty days of the date of said contract and provided further that said organization of clinics or hospitals shall be organized on a mutual or cooperative non-profit plan in connection with some recognized farm or labor union or church or charitable organization"; (3) to make it a ground for revocation or suspension of a license for a licentiate to have professional connection with or to lend his name to any person engaged unlawfully in the practice of medicine and surgery or for a licentiate to engage in practice under any name other than the one specified in his license; (4) to provide that a licentiate whose license has been revoked or suspended by the board of examiners may appeal to the district court of the county of his residence, which is to try the case de novo, the present law providing for an appeal directly to the Supreme Court from the decision of the board, and (5) to provide that no decision of the board revoking or suspending a license shall become final "pending final decision of the Supreme Court of this State." H. 624 proposes to repeal the present chiropractic practice act and apparently the basic science act so far as it relates to chiropractors. The bill proposes that the governor of the state, the secretary of state and the chairman of the corporation commission shall constitute a board of commissioners to determine the reputability of chiropractic educational institutions. A person desiring to practice chiropractic must apply to this board for a certificate of reputability of the chiropractic institution from which he graduated. On the issue of such a certificate, a person designated as a trustee to enforce the act is required to issue without examination or any other showing of qualifications a license to practice chiropractic. Apparently an applicant to obtain such a license need not pass a basic science examination. The bill proposes to define chiropractic as "the science and art of Chiropractic as taught in reputable Chiropractic Educational Institutions; provided that the art of Chiropractic consists in the palpation and adjusting of disrelationship in or of the vertebral column, and incidentally that of any part of the human body that in any manner affects the attitude or relationship of the vertebral column, by the hands of the Chiropractor only, to relieve or remove interference with the receipt, transmission, or application of nerve force."

Pennsylvania

Bills Introduced.—H. 671 proposes a system of compulsory and voluntary health insurance, the benefits of which are to consist, among other things, of all forms of medical, dental and hospital services. All employees except farm laborers and domestic servants of an employer having less than three domestic servants are to be subject to the compulsory features of the bill. All other persons may elect to come under the voluntary provisions of the bill. H. 685 and H. 686 propose to authorize the organization of corporations to operate nonprofit medical service plans whereby medical services may be provided to subscribers of low income "for prepayment, periodical or lump sum payments." H. 709 proposes to prohibit the manufacture, distribution or advertising of misbranded or adulterated foods, drugs, cosmetics and devices. H. 716 proposes to authorize any licensed optometrist to issue the certificate of ocular and visual efficiency which may be required by any law of the commonwealth or by any ordinance or resolution of any political subdivision of the commonwealth. H. 727 proposes (1) to prohibit the operation of a pharmacy or hospital unless registered with the State Board of Pharmacy and (2) to prohibit any person or broker, except a person owning or operating or employed in a pharmacy, hospital, place of manufacture or wholesale vender's place of business from vending any drugs, cosmetics or medical supplies unless licensed by the State Board of Pharmacy. H. 728 proposes to place the sale and distribution of cosmetics, as defined, within the prohibitions of the pharmacy practice act. H. 756 proposes to require the Department of Welfare to supply hearing aids or devices to persons who are deaf or hard of hearing and who are financially unable to purchase them. H. 934 proposes to authorize the formation of corporations "for the purpose of establishing, maintaining and operating a non-profit healing art service plan whereby healing arts services may be provided through any person registered with such corporation to subscribers thereto and their dependents." Healing art services, according to the bill, means the general and usual services rendered and care administered by doctors of medicine, doctors of osteopathy, dentists, registered nurses and registered pharmacists. The bill proposes that each branch of the healing arts noted which desires to participate in such a corporation shall have at least one incorporator and that no branch of the healing arts shall have a majority of incorporators. S. 318 proposes to authorize the sexual sterilization of inmates of state institutions who are criminally insane or who have been convicted a second time of a sex crime. H. 786 proposes to enact a separate chiropractic practice act and to establish an independent chiropractic board of examination and licensure to examine and license persons applying for licenses to practice chiropractic. The bill defines chiropractic as "the examination of the human spine by observation palpation or X-ray and the adjustment of any or all misalignments of vertebrae or adjacent bones or tissues through the use of the hands." H. 818 proposes to appropriate $10,000 to the Department of Health for the care and maintenance of carriers of typhoid fever bacilli.

Rhode Island

Bill Passed.—H. 782 passed the house March 29, proposing to grant to hospitals treating persons injured by reason of an accident not covered by the workmen's compensation act, liens on all claims, rights of action, judgments or compromises accruing to the injured persons because of their injuries.

Bill Introduced.—S. 181 proposes to require all applicants for licenses to practice any form of the healing art as a condition precedent to examination and licensure by their respective "professional" boards, to pass examinations in anatomy, physiology, pathology, symptomatology, chemistry, bacteriology and public health, to be given by the board of examiners in the basic sciences. The members of this board are to be selected because of their knowledge of the basic sciences mentioned and each member is to be a member of the faculty either of Brown University, of Rhode Island State College or of Providence College. No member of the board may be actually engaged in the practice of the healing art.

Texas

Bill Introduced.—H. 897 proposes to prohibit the sale of any truss or other mechanical device commonly used for the relief of rupture or hernia, except on the written prescription of a licensed physician. The bill also proposes to make it unlawful for any person other than a licensed physician to offer to fit any such truss or mechanical device.

Vermont

Bill Enacted.—H. 68 was approved by the governor April 10, authorizing the organization of corporations to operate nonprofit hospital service plans whereby hospital care may be provided by hospitals with whom such corporations have contracted for such care to such of the public as become subscribers to plans under contracts which entitle each subscriber to stated hospital care.

Wisconsin

Bills Introduced.—A. 543, to amend the medical practice act, proposes that no hospital supported in whole or in part by public funds or exempt from public taxation shall discriminate against any physician whose license to practice has been revoked and subsequently restored, nor deny him admission to practice in such hospital. A. 574 proposes to require the expenditure annually of $25,000 for the study of and research into the causes, prevention and cure of cancer. A. 599 proposes to require licensed physicians who are nonresidents to file their licenses or certificates with the county clerk in each county in which they practice.

WOMAN'S AUXILIARY

Georgia

At a meeting of the auxiliary to the Clark County Medical Society, Dr. W. D. Gholston, Danielsville, spoke on socialized medicine. Miss Susan Myrick, columnist and feature writer of the Macon *Telegraph*, spoke on "Problems of the Adolescent" at a recent meeting of the auxiliary to the Bibb County Medical Society.

The auxiliary to the Fulton County Medical Society met recently at the Academy of Medicine in Atlanta. Mrs. Warren A. Coleman, president of the auxiliary to the Medical Association of Georgia, and Dean Raimundo de Ovies of St. Phillip's Cathedral gave addresses. The auxiliary sponsored a health program January 11, attended by presidents and health chairmen of the Parent Teacher Association. A film, "Three Counties Against Syphilis," depicted the work of the mobile unit last summer. The auxiliary has raised funds for the treatment of patients with infantile paralysis.

The auxiliary to the Richmond County Medical Society met at the home of Mrs. Ralph Chaney, Augusta, in November. Miss Fannie B. Shaw, director of health education of the state department of public health, was the speaker.

Idaho

The auxiliary to the Boise Medical Society met at the home of Mrs. O. F. Swindell January 10. Mrs. Edith Davis spoke on problems arising in the home and school in the care of twins and triplets. The south side auxiliary met January 13 at Twin Falls. Mrs. A. A. Boston reviewed an article on the American Medical Association which was recently published in *Fortune* magazine.

The auxiliary to the North Idaho Medical Association met in Lewiston January 18. The auxiliary is preparing a history of the medical men who were pioneers of the region and a collection of old instruments and other equipment used by them.

The auxiliary to the Kootenai County Medical Association met at the home of Mrs. Alexander Barclay Jr. in Coeur d'Alene January 3. Mrs. R. T. Henson, president, asked members to cooperate with other auxiliaries in compiling data on the early physicians of Idaho. Garments for infants were made and will be distributed through the county health unit.

Illinois

An auxiliary to the DeWitt County Medical Society was recently organized with the assistance of Mrs. Charles C. Winning, chairman of organization of the auxiliary to the Illinois State Medical Society.

Dr. Harry Otten, Springfield, spoke on socialized medicine at a meeting of the auxiliary to the McLean County Medical Society January 10.

At a meeting of the auxiliary to the Sangamon County Medical Society in Springfield January 9 Mrs. S. R. Magill reviewed "The Stormy Petrel of Surgery," and February 13 Dr. G. Henry Mundt of Chicago spoke on socialized medicine.

Iowa

The sixth Annual Health Essay Contest, sponsored by the Iowa State Medical Society on "Good Health and How to Maintain It," closed March 15. Any high school student in Iowa was eligible to participate. The judges included a member of the state department of public instruction, of the state department of health and of the Iowa State Medical Society and two members of the auxiliary.

Kentucky

The auxiliary to the Hardin County Medical Society in Elizabethtown was addressed by Mrs. Walter Scott, who spoke on the antepartum and maternity work which the TVA is doing in conjunction with the public health service.

Mrs. Arthur T. McCormack entertained the auxiliary to the Jefferson County Medical Society at Louisville on the occasion of the birthday of the Woman's Auxiliary Section of the *Kentucky Medical Journal*.

The Auxiliary has established a benevolent fund for widows and orphans of former members of the Jefferson County Medical Society. At a party to raise money for this fund in November $119 was realized. On November 30, the auxiliary, cooperating with the Social Hygiene Association, sponsored a motion picture "Under Five Flags," raising $25 for the benefit of the sewing unit of the auxiliary. The Hospital Committee raised funds for the Children's Free Hospital at Christmas time, and also distributed gifts to patients in the City Hospital.

Minnesota

The auxiliary to the Olmsted-Houston-Fillmore-Dodge County Medical Society met at the Mayo Foundation House, Rochester, January 4. Edward H. Weld Jr. discussed health insurance plans being tried in various localities. Mrs. H. C. Habein, president, gave an illustrated talk on England.

Dr. George A. Earl and Mr. F. M. Brist addressed the board meeting of the auxiliary to the Minnesota State Medical Association in St. Paul February 1.

Nebraska

Mrs. Lucian Stark, former member of the state legislature of Nebraska, discussed lobbying and legislative procedure at a meeting of the board of directors of the auxiliary to the Nebraska State Medical Association in Lincoln, January 16.

Oklahoma

The auxiliary to the Pittsburg County Medical Society met in December and prepared Christmas baskets, also contributing cod liver oil to families in need of this remedy. January 13 a meeting was held in McAlester. Mrs. Walter Dell reviewed the "Life of Baron Lerry, French Military Surgeon."

The auxiliary to the Garfield County Medical Society is helping underprivileged children in Enid.

Dr. Ned R. Smith gave an address on socialized medicine in foreign countries at a meeting of the auxiliary to the Tulsa County Medical Society January 3.

The auxiliary to the Oklahoma City Medical Society, January 25, resumed their regular monthly sewing and scrap-book making for the Crippled Children's Hospital, with sixty-seven members present. A report on Medical Legislation was given by Mrs. George Garrison, president of the auxiliary to the Oklahoma State Medical Association.

Oregon

An auxiliary to the Josephine County Medical Society was organized at Grants Pass in October. An address was given by Dr. S. B. Osgood, secretary of the county society. The members will have as a definite project the distribution of *Hygeia*.

The auxiliary to the Coos-Curry Counties Medical Society was held at Bandon in November. Many of the members drove long distances to attend the meeting. A program was held on "Socialized Medicine and How the Auxiliary Can Combat It."

Dr. Charles E. Sears spoke on "What the Medical Society Can Do to Provide Better Medical Aid to the People," and Dr. R. L. Benson on "The National Health Conference" before the auxiliary to the Multnomah Medical Society.

The Oregon auxiliary will stress the study of socialized medicine in all its auxiliaries this year.

Pennsylvania

The auxiliary to the Allegheny County Medical Society met in Pittsburgh November 22. Plans were made for forming study groups for the discussion of socialized medicine. Dr. George R. Harris, secretary of the medical society, and Mr. Homer Saint Gaudens, director of the Department of Fine Arts of Carnegie Institute, were speakers.

The auxiliary to the Berks County Medical Society in Reading January 21 held a health conference. Mrs. Augustus S. Kech discussed socialized medicine and Dr. Harry B. Corrigan spoke on "Communicable Diseases and Their Prevention."

Mrs. Walter F. Donaldson, president of the auxiliary to the Medical Society of the State of Pennsylvania, was speaker at a recent meeting of the auxiliary to the Lehigh Medical Society.

The auxiliary entertained with a card party November 30 for the benefit of the Medical Benevolence Fund.

The auxiliary to the Chester County Medical Society met at Glen Mills School November 15. The program was arranged by Major H. R. Hickman, superintendent.

At a meeting of the auxiliary to the Northampton County Medical Society November 9 Mrs. Donaldson spoke briefly on the enlarged public relations program that the state medical society had planned for the auxiliaries, suggesting that the county auxiliary hold a health institute each year.

South Carolina

Dr. W. A. Hart discussed the new Maternal Health Center in Richland County before the auxiliary to the Columbia Medical Society in November.

Dr. John F. Rainey spoke on heart disease in December before the auxiliary to the Greenville Medical Society. Among the guests were Mrs. Charles P. Corn, president-elect of the auxiliary to the Southern Medical Association, and Mrs. C. C. Ariail, president of the auxiliary to the South Carolina Medical Association.

Mrs. C. C. Ariail addressed the auxiliary to the Spartanburg County Medical Society at a recent meeting on "The Doctor's Wife and the Educational Project to Be Sponsored by Each Auxiliary."

Wisconsin

The auxiliary to the Dane County Medical Society, Madison, January 11, voted to donate $10 to the Chinese Aid Council for nursing and medical supplies.

The auxiliary to the Medical Society of Milwaukee County gave a tea and musicale in honor of the new officers January 13. More than 100 members were present. Dr. Eben J. Carey, dean of Marquette University School of Medicine, discussed the national health program at a meeting of the auxiliary February 10.

MEDICAL ECONOMIC ABSTRACTS

CASH INSURANCE IN FRANCE

According to a report of the French delegate to the recent meeting of the International Medical Association, the existence of a partial cash indemnity provision in the French system has enabled it to pass through a recent crisis without resorting to that deterioration of quality of medical service and consequent deception of the patient that invariably characterize such crises in systems based on service benefits.

According to the report, which appears in the *Revue internationale de médecine professionnelle et sociale* (**11**:133 [Nov.] 1938), the fall in the value of the franc led to an increase in the income limits for the insured and compelled the physicians to raise their fees as measured in the falling franc. The French system of sickness insurance provides that the insured shall pay approximately 20 per cent of a legal reimbursement fee schedule. The physician may charge whatever fee he wishes, which is paid by the insured, who then looks to the insurance organization for reimbursement of 80 per cent of a fixed schedule.

In 1937 and 1938 the cost of living increased so rapidly in Paris that the physicians were compelled to increase their charges. Since the reimbursement schedule remained fixed, the burden on the insured became much heavier until they were required in many cases to pay 50 per cent of the cost. To meet this situation, which in other countries has been met by a forced reduction of the quality of the service, the insurance administration, which had already raised the salaries of its own administrators, was compelled by the Ministry to raise the schedule of reimbursement. In spite of this increase, the insured is still compelled to pay about one third of the costs.

The French representative explains that the French system at least permits some fairly rapid adjustments to monetary or economic changes without the long and usually hopeless conflicts between physicians and insurance societies which arise out of attempts to adjust the payment for medical service.

UNEMPLOYMENT AND HEALTH INSURANCE IN GREAT BRITAIN

While the benefits provided by unemployment insurance in Great Britain have been frequently changed to meet conditions, health insurance provisions remain inflexible. This puzzles the Bureau of Research and Statistics of the Social Security Board, which has just published a report on "Unemployment and Health Insurance in Great Britain, 1911-1937," in which this conclusion concerning alterations in the respective systems is repeated several times. A royal commission was similarly puzzled in 1926 and could only say that this condition "seems to us difficult to defend."

The Bureau of Research and Statistics and the royal commission compared only cash payments for unemployment in the two systems and both overlooked the existence of the same failure to alter terms in accordance with new conditions in the provision for medical treatment. This inflexibility in medical service works a far greater injustice and probably offers the real explanation of the failure of cash payments during illness to keep step with similar payments under unemployment insurance. All existing compulsory sickness insurance systems balance their books by failure of patients to evaluate the quality of medical service given; this makes it unnecessary to raise cash premiums as scientific progress increases the cost of providing benefits.

Flexibility in unemployment insurance is due primarily to the fact that premiums and benefits are both paid in cash, the value of which can be judged by the insured. The inflexibility in sickness insurance is maintained by reason of the fact that when cash premiums are changed into service benefits before they reach the insured the latter are unable to judge what they receive and do not realize that the books are balanced at the expense of their health.

BEWARE OF COLLECTION AGENCIES

The officers of a large midwestern collection agency which used an "account purchasing" contract were sentenced to serve three years for use of the mails to defraud. After some court delays these officers are now in custody and on the way to the penitentiary.

For years physicians have been warned by THE JOURNAL to beware of collection agencies, especially those using contracts. An account purchasing contract gives the appearance of being a finance plan by promising to pay the physician from 50 to 80 per cent of the face value of current accounts listed for collection. Actually the agency using such a contract is not obligated to liquidate any accounts but offers the account purchasing device as an inducement to obtain a list of delinquent accounts from the physician.

Once the physician has signed this type of contract, he finds that it contains all the provisions of the old collection contract, permitting the agency to have ownership of the accounts, power of attorney to settle the accounts in any manner which the company chooses, full commissions on accounts when the dissatisfied physician seeks to have them withdrawn, and perhaps a docket fee entitling the agency to 50 cents on each account listed. A special feature of the account purchasing contract permits the agency to retain 25 or 30 per cent of the aggregate amount of the accounts listed for collection. If $500 worth of accounts has been listed, the agency is entitled, under the 30 per cent contract, to $150 before the physician has to be paid anything.

With the precedent set by the aforementioned case, collection agencies which pretend to be finance companies and withhold an accounting of money collected from delinquent debtors are now recognized by postal authorities as "schemes to defraud." Agents or officers of the agency in question have organized at least five other collection agencies which use similar contracts. There are also many other independently organized agencies that use such "account purchasing" contracts. The post office inspectors are waiting for complaints.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

ADDITIONAL MEDICAL COLLEGE NEWS AND ARTICLES APPEAR IN THE STUDENT SECTION, PAGE 1643.

CALIFORNIA

University News.—A short course for practicing physicians on "Endocrinology and Related Metabolic Diseases" was given at the University of California Medical School, San Francisco, April 5-8. The medical school observed "alumni day" March 22 as a part of the celebration commemorating the seventy-first charter anniversary of the University of California.

Epidemic Diarrhea of the Newborn.—Two outbreaks of epidemic diarrhea in the newborn were investigated during February, one in the southern part of the state and the other in northern California, according to the bulletin of the state board of health. Both outbreaks occurred in nurseries connected with institutions. Clinically, they were identical. Within from five to seven days after birth the infants became ill with diarrhea, dehydration, loss of weight and toxemia. Eleven cases occurred in one nursery and twenty-seven in the other. The exact cause of these outbreaks is unknown and all bacteriologic work undertaken up to March 18 had proved negative. Certain control measures have proved effective in preventing the spread of the epidemic.

COLORADO

Annual Spring Clinics. — The sixth annual spring clinics of the Pueblo County Medical Society will be presented April 28-29 at the Congress Hotel, Pueblo. The speakers will be:

Dr. John B. Farley, Pueblo, Corpus Luteum and Its Role in Vomiting of Pregnancy.
Dr. Scott A. Gale, Pueblo, The Kidney in Pregnancy.
Dr. William T. H. Baker, Pueblo, Congenital Uterine Malformations.
Dr. Clinton K. Smith, Kansas City, Mo., Urinary Infections.
Dr. John D. Geissinger, Pueblo, Vomiting in Infancy.
Dr. Charles W. Streamer, Pueblo, A Résumé of Some of the Newer Things in Medicine.
Dr. Lester L. Ward, Pueblo, Lesions of the Lung Excluding Pneumonia and Tuberculosis.
Dr. Osgoode S. Philpott, Denver, Current Ideas Regarding Etiology, Diagnosis and Treatment of Herpes Zoster.
Dr. Francis W. Cutts, Pueblo, Fatalistic Attitudes in Modern Medicine.
Dr. Samuel B. Potter, Pueblo, Relaxations of the Pelvic Floor: Causes.
Dr. J. Sims Norman, Pueblo, Early Orthopedic Treatment of Infantile Paralysis.
Dr. William Andrew Bunten, Cheyenne, Craniocerebral Injuries.
Dr. Kenneth M. Kelley Jr., Pueblo, Toxic Reactions Following the Use of Sedatives.
Dr. Royal H. Finney, Pueblo, Amebiasis.
Dr. Frank H. Zimmerman, Pueblo, Dementia Praecox.
Dr. Tate Miller, Dallas, Texas, Colitis.

In the evening there will be a stag banquet at the Colorado State Hospital.

CONNECTICUT

The State of Health.—The general death rate in Connecticut was 9.7 per thousand population, the lowest on record, according to provisional figures. The births totaled 23,397 for the year, accounting for a rate of 13.1 per thousand population, the highest since 1933, when it was 13.2. The infant mortality rate was 36.3 per thousand living births. The maternal mortality rate was 2.9 per thousand living births from a total of sixty-seven maternal deaths.

DELAWARE

Society News.—A symposium on heart disease was presented before the New Castle County Medical Society, Wilmington, March 17 by members of the staff of the Woman's Medical College of Pennsylvania: Drs. Henry D. Jump, Robert G. Torrey, Jacob H. Vastine and William G. Leaman Jr. Dr. Joseph Stokes Jr., Philadelphia, discussed "Advances in the Study of Acute Infectious Diseases" before the society February 21. Dr. M. Edward Marten, Brooklyn, lectured at the Delaware Academy of Medicine March 28 on "Advantages of the State Medical Examiner in Contrast to the Present Coroner's Office."

DISTRICT OF COLUMBIA

Lectures by Professor Carlson.—Dr. Anton J. Carlson, professor of physiology, Department of Medicine, Division of Biological Sciences, University of Chicago, will address the Academy of Medicine, Washington, April 24 on "Science and the Common Life." He will address the Smith-Reed-Russell Society of George Washington University School of Medicine April 25 on "Notes on Medical Education and Medical and Public Health Services in Russia and China."

Portrait of Dr. William A. White.—A portrait of the late Dr. William A. White, former superintendent of St. Elizabeths Hospital, Washington, was presented to the hospital by the Rev. U. G. B. Pierce, president of the board of visitors, on behalf of Dr. White's friends and associates. It was accepted on behalf of the Department of the Interior by Secretary Harold L. Ickes, who paid tribute to Dr. White's contribution to the hospital and to American psychiatry and who emphasized the fact that the hospital "always had been administered by outstanding men who had been free from political interference." Dr. Winfred Overholser, superintendent, announced that Mrs. White had given to the hospital Dr. White's library relating to psychiatry and the broad field of medical sciences; it was formally accepted by Secretary Ickes.

IDAHO

New Director of Public Health. — Dr. Howard L. McMartin, Boise, formerly director of the division of maternal and child health and crippled children, state department of public welfare, has been appointed director of the division of public health of the department.

ILLINOIS

Tuberculosis Meeting.—The annual meeting of the Illinois Tuberculosis Association will be held at the Pere Marquette Hotel, Peoria, April 24-25. Among other speakers will be Drs. Edward Kent Ellis, Murphysboro, "The Family Physician and the Tuberculosis Problem in Southern Illinois"; William T. Holladay, Amboy, "The Family Physician Views the Tuberculosis Problem"; Loren L. Collins, La Salle, "The Sanatorium Aids the Family Physician," and Frederick M. F. Meixner, Peoria, "The Peoria Sanatorium District."

State Medical Meeting in Rockford.—The ninety-ninth annual meeting of the Illinois State Medical Society will be held at Rockford May 2-4 with headquarters at the Faust Hotel, under the presidency of Dr. Samuel E. Munson, Springfield. Dr. Leroy E. Parkins, Boston, will deliver the oration in medicine Tuesday afternoon on "Integration of Personality Factors in Health and Disease" and Dr. Hiram Winnett Orr, Lincoln, the oration in surgery Wednesday morning on "The Prevention and Cure of Local and General Infection in Compound Fractures and Other Open Wounds." Among the physicians on the program are:

Dr. Isidor Harrison Tumpeer, Chicago, The Upper Respiratory Revenge of the Allergic Child.
Dr. Mitchell A. Spellberg, Chicago, Role of Cevitamic Acid in Various Clinical Conditions.
Dr. Karl A. Meyer, Chicago, Management of Local and Spreading Peritonitis Associated with Appendicitis.
Dr. Warren H. Cole, Chicago, Surgery of the Common Bile Duct.
Dr. Winston H. Tucker, Evanston, Rocky Mountain Spotted Fever in Illinois.
Dr. Howard A. Lindberg, Chicago, The Pneumonia Control Program in Illinois.
Dr. Pierre A. Steele, Decatur, Tularemia.
Dr. Lawrence M. Hilt, Grand Rapids, Mich., Some Pitfalls in Roentgenologic Diagnosis.

The program includes symposiums on pneumonia and fractures, one session on endocrinology and Tuesday afternoon the following instruction courses:

Dr. Jacob J. Potter, Rockford, Anatomy and Pathology of the Middle Ear Tract.
Drs. Thomas C. Galloway and Eustace L. Benjamin, Evanston, Acute Laryngeal Obstruction: Its Causes, Pathology and Treatment.
Dr. Thomas D. Allen, Chicago, Gonioscopy.
Dr. George P. Guibor, Ottawa, Ill., Concomitant Strabismus. Some Important Details in Its Diagnosis.

The secretaries' conference will be held Tuesday evening with the following speakers:

Dr. Robert S. Berghoff, Chicago, Cooperation of the County Secretaries with the Scientific Committee.
Dr. William W. Bauer, Chicago, The Influence of Health Education on the Practice of Medicine.
Dr. Herman M. Soloway, Chicago, Syphilis Control in Illinois: Its Relation to County Societies.

Among others, Dr. Elston L. Belknap, Milwaukee, will address the Central States Society of Industrial Medicine and Surgery Tuesday morning on "Practical Tests of Functional Capacity in Silicotics." At a meeting of the Physicians' Asso-

ciation, state department of public welfare Tuesday a feature will be a symposium on mental disorders following head trauma. The president's dinner will be Wednesday evening with Dr. Rock Sleyster, Wauwatosa, Wis., President-Elect, American Medical Association, as the speaker. There will also be a veterans' service committee dinner and various alumni luncheons.

Chicago

Lectures at Billings Hospital.—Dr. August Krogh, director of the Institute of Zoophysiology, University of Copenhagen, Denmark, and winner of the 1920 Nobel Prize in physiology, will lecture at the Billings Hospital, University of Chicago, May 2. His subject will be "The Effects of Posture on Circulation." Dr. Thomas Addis, San Francisco, will lecture at the hospital April 24 on "The Treatment of Nephritis."

Surgical Prize Awarded to Dr. Hedin.—The first annual award of the Chicago Surgical Society will be made at a meeting of the society May 5 to Dr. Raymond F. Hedin of Cook County Hospital and the department of surgery, Rush Medical College. Dr. Hedin's essay, entitled "Polypoid Disease of the Colon: Two Proposed Surgical Procedures, Including the Description of a Colonoscope," will be presented at the same meeting. The $250 prize is offered to some young man devoting himself to surgery in Chicago, who is not a member of the Chicago Surgical Society, for meritorious work in one or both of the fields of experimental and clinical surgery.

Course on the Rorschach Method.—S. J. Beck, Ph.D., will conduct a course in the application of the Rorschach method at Michael Reese Hospital, Chicago, May 15-20, the week following the annual convention of the American Psychiatric Association. Additional information may be obtained from the librarian of the hospital. Tentative plans are also being made for a similar ten day course to be offered later in the summer. The dates will be arranged to meet the convenience of prospective registrants. Interested persons having preferences as to date are invited to communicate with the librarian of the hospital.

INDIANA

Changes in Health Officers.—Dr. William Harry Hutto has been appointed health officer of Kokomo and secretary of the city board of health, succeeding Dr. William J. Martin. Dr. Claude Dollens, Oolitic, has been appointed health officer of Lawrence County, succeeding the late Dr. John S. Woolery, Bedford. Dr. Thomas J. McKean, Montpellier, has been named health officer of Blackford County to succeed the late Dr. Elmer D. Shadday.

Society News.—Dr. Jacob Arnold Bargen, Rochester, Minn., discussed "Medical and Preoperative Management of Intestinal Obstruction" before the Tippecanoe County Medical Society at Lafayette April 11.——The LaPorte County Medical Society was addressed in Michigan City March 16 by Dr. Reed M. Nesbit, Ann Arbor, Mich., on "Treatment of Urinary Tract Infections with Reference to the Newer Drugs."——At a meeting of the Floyd County Medical Society, New Albany, March 10, Dr. John F. Habermel, New Albany, spoke on "Early Signs and Symptoms of Cancer."——Dr. Andrew M. Brenner, Winchester, addressed the Randolph County Medical Society in Winchester March 13 on "Electrocardiography and Its Practical Application."——At a meeting of the Madison County Medical Society, Anderson, recently Dr. Kenneth G. Kohlstaedt, Indianapolis, spoke on "Medical Treatment of Biliary Tract Diseases."——Dr. Raymond W. McNealy, Chicago, addressed the Muncie Academy of Medicine March 14 on "Vitamins in Surgery."

IOWA

Public Health Meeting.—The Iowa Public Health Association will hold its thirteenth annual meeting at the Hotel Savery, Des Moines, April 24. The following speakers will participate, among others:

Dr. Roy R. Jones, U. S. Public Health Service, Medical Aspects of Industrial Hygiene.
L. O. Nolf, Ph.D., Iowa City, Trichina Larvae in Rats: Relation to Trichiniasis (Trichinosis) in Man.
Dr. Florian E. Schmidt, Chicago, Present Status of Antipneumococcic Serum and Sulfapyridine in the Management of the Pneumonias.
Dr. Paul Stephen, Des Moines, Report of a Food-Borne Epidemic of Typhoid Fever.

State Medical Meeting in Des Moines.—The eighty-eighth annual session of the Iowa State Medical Society will be held at the Hotel Fort Des Moines, Des Moines, April 25-27 under the presidency of Dr. Arthur W. Erskine, Cedar Rapids, whose address will be entitled "Principles and Practice." Out-of-state speakers will include:

Dr. Soma Weiss, Boston, Treatment of Circulatory Collapse and Shock.
Dr. Nymphus Frederick Hicken, Omaha, Diagnosis of Breast Tumors with Management of Carcinoma.
Dr. Edwin A. Merritt, Washington, Hyperparathyroidism and Its Roentgen Treatment.
Dr. Frank H. Lahey, Boston, New Ideas in Thyroid Surgery.
Dr. William H. Holmes, Chicago, Bacillary Dysentery.
Col. Kent Nelson, Omaha, Medical Department of the United States Army in Civilian Conservation Corps Activities.
Dr. William L. Benedict, Rochester, Minn., The Etiology of Chorioretinitis.
Dr. Willis C. Campbell, Memphis, Tenn., Use of Vitallium for Fixation of Fractures.
Dr. Irvin Abell, Louisville, Ky., subject not announced.
Dr. Harold R. Conn, Akron, Ohio, Treatment of Fractures of the Spine.

Tuesday and Wednesday afternoons the program will be devoted to sectional conferences, including a symposium on the determination of alcohol in blood and urine. Thursday afternoon there will be a symposium on fractures. A smoker will be held Tuesday evening and the annual banquet Wednesday evening. The forty-second annual meeting of the State Society of Iowa Medical Women will be held April 25. Branch 19 of the American Medical Women's Association will also meet the twenty-fifth. The tenth annual session of the woman's auxiliary to the state medical society will be held April 25-26.

KENTUCKY

State Bureau of Medical Service Created.—At the request of the council of the Kentucky State Medical Association, a bureau of medical service has been created in the state department of health, with Dr. John B. Floyd, Richmond, as director. The bureau will assist the medical profession of the state in providing medical service for the indigent and the medically indigent. The director will be available for consultation with the profession in the formulation of plans, rules and regulations. The resolution submitted to the governor by the council of the state medical association stipulated that all plans provide for freedom of choice of physician, that there should be no restrictions on prescription or treatment except such as are necessary for protection of the public health and, further, that any expenditures made for the expansion of public health and maternal and child health services should not include treatment of disease except so far as this cannot be accomplished through private physicians. Dr. Floyd, a graduate of the University of Louisville School of Medicine in 1915, has been director of the bureau of tuberculosis of the state health department for two years. He formerly practiced in Richmond. He has served two terms in the state legislature. The council's request to the governor for the establishment of the bureau was made at the request of Drs. Irvin Abell, chairman of the committee on public relations; Arthur C. McCarty, chairman of the committee on medical economics, and Elmer L. Henderson, chairman of the committee on the study and provision of medical care of the state medical association, all of Louisville.

LOUISIANA

State Medical Meeting at Alexandria.—The sixtieth annual meeting of the Louisiana State Medical Society will be held at the Bentley Hotel, Alexandria, April 24-26, under the presidency of Dr. Joseph A. O'Hara, New Orleans. The guest speakers will include Judge William H. Byrnes Jr., New Orleans, who will deliver the annual oration; Dr. James C. Masson, Rochester, Minn., on "Carcinoma of the Uterus," and Dr. Sidney A. Portis, Chicago, "Hepatitis: Its Etiology, Diagnosis and Treatment." Among the Louisiana physicians on the program are:

Dr. Maurice Campagna, New Orleans, The Incidence of Peptic Ulcer in the Negro.
Dr. John Preston Davis, Lake Providence, Symptoms, Diagnosis and Treatment of Pellagra with Special Reference to the Use of Nicotinic Acid.
Drs. Dean H. Duncan, Shreveport, and Ernest N. Carmouche, Pineville, Metrazol Therapy in Psychotic Excitement.
Drs. Joseph R. Kriz and Herbert J. Schattenberg, New Orleans, Endometrial Changes and Their Relation to Ovarian Dysfunction.
Dr. Henson S. Coon, Monroe, Use of an Anatomicophysiologic Incision in Appendicitis.
Dr. Monte F. Meyer, New Orleans, Fractures of the Malar Bone with Eye, Ear, Nose and Throat Complications.
Drs. Joseph N. Ane and Leon J. Menville, New Orleans, Irradiation Therapy in Endocrine Dysfunction.

The past presidents' dinner will be held Monday evening April 24. Entertainment during the session will include golf and skeet. Other societies planning to meet at this time are the Louisiana Pediatric Society, Louisiana Gynecological and Obstetrical Society, Louisiana Urological Society, the Loui-

siana branch of the National Gastro-Enterology Society and the Louisiana Coroners' Association. There will also be a conference of eye, ear, nose and throat specialists.

MARYLAND

Monthly Meetings on Maternal Mortality.—The Baltimore City Medical Society has adopted a plan to hold monthly meetings to discuss the problems of maternal mortality, the first of which will be held April 27. The plan follows the suggestion of the maternal mortality committee and is akin to the study of maternal deaths in Baltimore which has been conducted for the past three years by a joint committee representing the Baltimore City Medical Society and the city health department. This survey will be continued two more years. In the monthly sessions devoted to this subject, the name of the patient, the name of the physician and the name of the hospital, if death occurred in a hospital, will not be made known. The meetings will be held on the fourth Thursday of each month and will be open to any physician practicing in Maryland.

MASSACHUSETTS

Annual Session of Psychiatry Society.—The New England Society of Psychiatry will hold its annual meeting at the Metropolitan State Hospital, Waltham, April 25. The speakers will include John W. Thompson, Ch.B., Boston, and Dr. William Corwin, Waltham, on schizophrenia.

Society News.—A symposium on the use of physical medicine in orthopedics will be presented before the New England Society of Physical Medicine, Boston, April 26 by Drs. Claude L. Payzant, Howard Moore and Gordon M. Morrison and Lucy G. Marshall, P.T. Dr. Abraham Myerson, Boston, discussed "Combined Physical Therapy and Motivation in the Treatment of the Psychoses" before the society March 15.

Extension Courses.—The Massachusetts Medical Society cooperating with the state department of public health, the U. S. Public Health Service and the U. S. Children's Bureau recently conducted the following extension courses:

Dr. Meinolph V. Kappius, March 5, Barnstable, Bleeding in the Third Trimester of Pregnancy.
Dr. Roy J. Heffernan, March 2, Bristol North, Operative Obstetrics.
Dr. Richard Cannon Eley, February 28, Bristol South, Whooping Cough: The Present Status of Vaccine Therapy Both as Prophylactic and Therapeutic Measure, the Early Diagnosis by Laboratory Procedures, and the Treatment of Complications.
Dr. Chester S. Keefer, March 2, Hampden, Anemia: Modern Methods in Diagnosis and Treatment of Blood Dyscrasias.
Dr. Laurence B. Ellis, February 28, Middlesex East, Bright's Disease and Hypertension: Evaluation of New Therapy: Diagnosis.
Dr. Howard B. Sprague, March 2, Middlesex North, Heart Disease: The Treatment of "Heart Attacks" or "Cardiovascular Emergencies."

The lecturers are all of Boston.

MINNESOTA

Postgraduate Courses.—The third annual series of postgraduate courses for physicians in obstetrics and pediatrics will begin April 26 to continue for five consecutive weeks in ten centers of the state, it is reported. Sponsored jointly by the Minnesota State Medical Association, the University of Minnesota Medical School and the state department of health, the course is financed by social security funds. The schedule of the courses is: April 26, Pine City and Winona; May 3, Fergus Falls and Little Falls; May 10, Willmar and Virginia; May 17, Worthington and Grand Rapids; May 24, Albert Lea and Crookston. There will be one full day meeting in each center, beginning at 8 a. m. and composed of eight lecture and discussion periods, four each on obstetrics and pediatrics.

NEW JERSEY

Society News.—Dr. Edgar Mayer, New York, addressed the Hudson County Medical Society April 4 on early diagnosis of tuberculosis.——Dr. Elliott C. Cutler, Boston, addressed the Academy of Medicine of Northern New Jersey, Newark, April 20 on "Postoperative Complications." Dr. Foster Kennedy, New York, will give a lecture at the academy April 27 entitled "A Critique on Present Trends in Medical Education" under the auspices of the academy's committee on public health and medical education and the health committee of the Newark Contemporary. Oscar Riddle, Ph.D., Cold Spring Harbor, N. Y., addressed a meeting of the academy March 16 on "Our Uncontrollable Governor—The Pituitary Gland."——Dr. William G. Leaman Jr., Philadelphia, addressed the Atlantic County Medical Society, Atlantic City, April 14 on "The Prognosis in Heart Disease."

NEW YORK

Women's Medical Meeting.—The Women's Medical Society of New York State will hold its annual meeting in Syracuse April 23-24 under the presidency of Dr. Madge C. L. McGuinness, New York. Papers will be presented by Drs. Sophie Rabinoff, New York, on "Some Health Problems in a District Health Program"; Jane Sands Robb, Syracuse, "Prognostic Significance of the S-T Interval" and Helen G. Walker, Buffalo, "Newer Aspects in the Diagnosis and Treatment of Tuberculosis." Drs. Laura C. Harris, Syracuse, and Marguerite P. McCarthy, Solvay, will present case reports on "Influenzal Meningitis with Recovery" and "Erythroblastic Anemia" respectively. Sunday afternoon the society will give a reception in honor of Dr. William A. Groat, Syracuse, president of the Medical Society of the State of New York, other officers and delegates to the state society.

New York City

The Adam Miller Lecture.—Dr. George Hoyt Whipple, dean and professor of pathology, University of Rochester School of Medicine and Dentistry, delivered the third annual Adam Miller Lecture at Long Island College of Medicine April 6. His subject was "Experimental Anemia and the Building of Hemoglobin in the Body."

Medical Committees for the World's Fair.—Committees in charge of the medical and health exhibits at the New York World's Fair were recently announced. Dr. Livingston Farrand, Brewster, is chairman of the general committee and the following are among chairmen of the subcommittees for the exhibits in the Hall of Medical Science:

Dr. Arthur W. Booth, Elmira, N. Y., chairman of the Board of Trustees of the American Medical Association, exhibit on medical education sponsored by the Association.
Dr. Rufus I. Cole, Mount Kisco, N. Y., exhibit on pneumonia, Lederle Laboratories.
Dr. Kendall Emerson, tuberculosis, Queensboro Tuberculosis and Health Association.
Dr. Alfred E. Cohn, heart disease, Ciba Pharmaceutical Products, Inc.
Dr. Francis Carter Wood, cancer, New York City Cancer Committee.
Dr. William F. Snow, syphilis, Parke, Davis & Co.
Dr. James Ralph Scott, diabetes, Eli Lilly & Co.
Dr. Paul Reznikoff, blood diseases and anemia, Eli Lilly & Co.
Dr. Oswald T. Avery, local and general infections, American Museum of Health, Rockefeller Foundation and Rockefeller Institute for Medical Research.
Dr. Thomas M. Rivers, filtrable viruses, same sponsors as for local and general infections.
Dr. Frederick P. Gay, immunity, same sponsors as for local and general infections.
Dr. Paul M. Wood, anesthesia, Winthrop Chemical Company.

OHIO

State Medical Meeting at Toledo.—The ninety-third annual meeting of the Ohio State Medical Association will be held in Toledo May 3-4 at the Commodore Hotel under the presidency of Dr. Barney J. Hein, Toledo. There will be three general sessions and six section meetings. Part of Wednesday afternoon will be devoted to round table conferences. Guest speakers at the general sessions will be:

Dr. Anthony J. Lanza, New York, Silicosis—Present Status.
Dr. Herman O. Mosenthal, New York, Treatment of Nephritis.
Dr. Elliott C. Cutler, Boston, Preoperative and Postoperative Care.
Dr. Allen F. Voshell, Baltimore, Important Features in the Treatment of Fractures.
Bradley M. Patten, Ph.D., Ann Arbor, Mich., Microcinematographic and Electrocardiographic Study of the First Heart Beats and the Beginning of the Circulation in Living Embryos.
Dr. Elmer L. Sevringhaus, Madison, Wis., Pituitary Therapy.
Dr. William W. Herrick, New York, Medical Complications of Pregnancy and the Puerperium.

Dr. Francis Bruce Fralick, Ann Arbor, will address the section on eye, ear, nose and throat on "The Muscle Balance in Routine Refractions"; the program also includes the following Ohio physicians:

Dr. Harry Goldblatt, Cleveland, Experimental Observations on the Treatment of Hypertension.
Dr. George M. Curtis, Columbus, Lobectomy in the Treatment of Bronchiectasis.
Drs. Charles S. Higley and Harry Hauser, Cleveland, Diagnosis, Prognosis and Treatment of Hodgkin's Disease.
Dr. James R. Reeves, Columbus, The Value of Skin Tests as an Aid to Biologic Therapy in Rheumatoid Arthritis.
Dr. John W. Holloway, Cleveland, Regional Ileitis.
Dr. William H. Evans, Youngstown, Problems of Nutrition Encountered by the Ophthalmologist and the Otolaryngologist.
Dr. Theodore T. Zuck, Cleveland, The Application of Recent Knowledge to the Management of Controlled Conditions.
Dr. Newton W. Kaiser, Toledo, Alcoholic Psychoses.
Dr. James G. Kramer, Akron, The Present Status of Pertussis Immunization.

Gov. John W. Bricker will speak at the banquet Thursday evening May 4. Another feature will be a public health luncheon sponsored by the section on public health and pre-

ventive medicine Wednesday noon, at which the speakers will be Drs. Carl A. Wilzbach, health officer of Cincinnati, and Roll H. Markwith, Columbus, new state health officer. There will also be a hobby exhibit and the annual golf tournament at the Sylvania Country Club, Toledo, Tuesday May 2.

PENNSYLVANIA

Society News.—Dr. Karl Kornblum, Philadelphia, addressed the Delaware County Medical Society, Chester, April 13 on "Roentgen Examination of the Maternity Patient."——Dr. Wells P. Eagleton, Newark, N. J., addressed the Blair County Medical Society March 28 on medical economics.——Dr. Joseph H. Barach, Pittsburgh, addressed the Fayette County Medical Society, Uniontown, April 6 on "Simplified Treatment of Diabetes."——Dr. Joseph C. Doane, Philadelphia, addressed the York County Medical Society, York, March 18 on "Alcoholism, Its Diagnosis and Treatment."——Dr. Henry T. Price, Pittsburgh, addressed the Harrisburg Academy of Medicine March 21 on "Meningitis in Children."——Dr. Aims C. McGuinness, Philadelphia, addressed the Dauphin County Medical Society, Harrisburg, March 7, on contagious diseases of childhood, with special reference to the uses of convalescent and immune human serums.

Philadelphia

Annual Campaign for Funds.—Philadelphia's annual campaign for funds, known as the "United Campaign" to finance 141 community agencies in welfare work is in progress for March and April. This year's goal is $4,000,000. It was stated that the fund was forced to cut its appropriations last year because insufficient money was collected.

Gifts to Woman's College.—The Woman's Medical College of Pennsylvania has received the following bequests in recent months: $25,000 from the late Dr. Jane Jenks Southern; $15,000 from the estate of Dr. Margaret P. Forcee-Kuyk, for endowment of the department of preventive medicine; $5,000 from the estate of Miss Maria Logan, Germantown; $7,500 from the estate of George Montgomery, New York, to establish a scholarship in the name of his deceased wife, Clara Babbitt Hyde Montgomery, and $20,000 from the estate of William E. Sellers for care of women and children in the college hospital.

Society News.—A symposium on prevention and early diagnosis of cancer was presented before the Philadelphia County Medical Society April 12 by Drs. Francis Ashley Faught, George E. Pfahler, John O. Bower, Louis H. Clerf, William Edward Chamberlain, Damon B. Pfeiffer and Catharine MacFarlane.——Speakers at a meeting of the Philadelphia Laryngological Society April 4 were Drs. Sol A. Goldberg on "Gangrene and Infection in Ear, Nose and Throat Complicating Diabetes Mellitus"; John B. Price, Norristown, Pa., "The Constitutional Background of Upper Respiratory Infections," and Myron A. Zacks, "Importance of Vestibular Findings Following Head Injuries."

Pittsburgh

Annual Meeting of County Society.—The Allegheny County Medical Society will hold its annual meeting May 2 at the William Penn Hotel with an afternoon scientific session followed by a banquet. The following speakers will appear on the scientific program:

Dr. Paul A. O'Leary, Rochester, Minn., Latent Syphilis and Wassermann-Fastness.
Dr. Walter E. Dandy, Baltimore, Diagnosis and Treatment of Lesions of the Cranial Nerves.
Dr. Wallace M. Yater, Washington, D. C., Heart Diseases Amenable to Surgery.
Dr. Harry E. Mock, Chicago, General and Special Rules in the Management of Skull Fractures.
Dr. Fred H. Albee, New York, Surgical Resection of Bone Sarcoma with Immediate Bone Graft Replacement.

Dr. Chauncey L. Palmer, president of the society, will preside, Hon. Cornelius D. Scully, mayor of the city, will make an address of welcome and Dr. Morris Fishbein, Chicago, Editor of THE JOURNAL, will speak on "American Medicine and the National Government."

SOUTH CAROLINA

Society News.—Dr. Herman J. Moersch, Rochester, Minn., addressed the Columbia Medical Society March 13 on "Inflammatory Lesions of the Gastric and Duodenal Mucosa: Their Significance in Medical Practice." Dr. Richard B. Josey, Columbia, spoke on "Cardiac Complications of Nephritis in Children."——Dr. Edwards A. Park, Baltimore, addressed the Florence County Medical Society, Florence, February 23 on "Vitamin Deficiencies."

TENNESSEE

The Flexner Lectures at Vanderbilt.—Dr. Albert Szent-Györgi, director of the Institute for Medical Chemistry and professor of medical chemistry, Royal Hungarian Franz Joseph University, Szeged, Hungary, is the guest of Vanderbilt University School of Medicine, Nashville, for two months under the Abraham Flexner Lectureship. During March Dr. Szent-Györgi delivered lectures on general principles of biologic oxidation, respiration of muscle, fermentation and some problems of intermediary metabolism, vegetable respiration and vitamins in health and disease. He is spending April at the university as visiting professor of biochemistry. Dr. Szent-Györgi was the winner of the Nobel Prize in physiology and medicine for 1937. The Flexner Lectureship was established in 1927 by Mr. Bernard Flexner, a brother of Abraham Flexner.

TEXAS

New Health Officers.—Dr. Lee E. Edens recently succeeded Dr. Durwood L. Dodd as health officer of Austin.——Dr. John M. Hooper, Floydada, formerly of Pampa, has been appointed director of public health for district No. 1, which includes sixty counties in the Panhandle and South Plains area.——Dr. Francis T. Isbell, Eastland, has been appointed health officer of Eastland County and Dr. Frank B. Boyle, Big Springs, of Howard County.

VIRGINIA

McGuire Lectures and Postgraduate Clinics.—Dr. Wilder G. Penfield, director of the Neurological Institute, McGill University Faculty of Medicine, Montreal, Canada, will give the McGuire Lectures at the Medical College of Virginia, Richmond, April 27-28 on "Epilepsy, Mechanism and Pathology" and "Epilepsies—Selective Study and Surgical Therapy." A postgraduate seminar on neuropsychiatry will be held on the morning of April 28 with the following speakers: Drs. Hugh C. Henry, Richmond, director of state hospitals and associate in psychiatry at the school; James Asa Shield, associate in psychiatry; Joseph R. Blalock, Marion, associate in psychiatry; Robert Finley Gayle Jr., professor of neuropsychiatry, and George B. Arnold, superintendent of the Capitol State Colony for Feebleminded and Epileptics, Colony. In the afternoon there will be discussions and demonstrations with the following participants: Drs. Charles Bagley Jr., Baltimore; John M. Meredith, Charlottesville; Claude C. Coleman and William Gayle Crutchfield, Richmond. The lectures will be at the Richmond Academy of Medicine.

WISCONSIN

William Snow Miller Lecture.—Dr. Ko Kuei Chen, professor of pharmacology, Indiana University School of Medicine, and director of pharmacologic research, Lilly Research Laboratories, Indianapolis, delivered the twelfth annual William Snow Miller Lecture at the University of Wisconsin Medical School, Madison, April 6. His subject was "Cyanide Poisoning and Its Treatment."

Society News.—Dr. Loyal Davis, professor of surgery, Northwestern University Medical School, Chicago, gave an address at the University of Wisconsin Medical School, Madison, March 11 under the auspices of Alpha Omega Alpha, on "Experimental and Clinical Experiences in the Surgical Treatment of Hypertension."——Dr. William J. Dieckmann, Chicago, addressed the Rock County Medical Society, Beloit, recently on "Toxemias of Pregnancy."——Dr. Walter G. Sexton, Marshfield, addressed the Winnebago County Medical Society, Oshkosh, March 2 on "Renal Stones."——Dr. Friedrich Eigenberger, Sheboygan, addressed the Sheboygan County Medical Society, Sheboygan, February 28 on "New Laboratory Methods in Diagnosis of Cancer." Dr. Dexter H. Witte, Milwaukee, addressed the Sheboygan Woman's Club February 21 at the request of the county medical society on "Medical Care."

WYOMING

District Meeting.—The third annual meeting of the Central District Medical Society was held at Casper April 15-16 with the following speakers:

Dr. Ralph M. Stuck, Denver, Surgical Treatment of Epilepsy.
Dr. John Harry Murphy, Omaha, Sulfanilamide, Its Use in Infectious Diseases of Children.
Dr. Atha Thomas, Denver, Treatment of Fractures of the Elbow in Children.
Dr. William W. Wasson, Denver, Diseases of the Lungs.
Dr. Paul J. Connor, Denver, Diseases of the Thyroid Gland in Relation to Endocrinology.
Dr. Clarence B. Ingraham, Denver, Difficult Labors.

GENERAL

The Kober Lecture.—Col. Joseph F. Siler, director of the Army Medical School, delivered the annual Kober Lecture at Georgetown University Medical School, Washington, D. C., March 28, on a new vaccine for typhoid developed by the army. Colonel Siler was presented with a check for $500, provided under the terms of the Kober Foundation. The speaker for this annual lecture is selected in alternating years by the Medical Society of the District of Columbia, the Association of American Physicians and the Association of Military Surgeons.

Society News.—At the recent annual business meeting of the American Heart Association in New York, the following officers were elected to serve two years: Drs. William D. Stroud, Philadelphia, president; Paul D. White, Boston, vice president, and Howard B. Sprague, Boston, secretary.——The twenty-fourth annual meeting of the National Recreation Association will be held in Boston October 9-13.——The annual meeting of the Associated State Committees on Postgraduate Medical Education will be held at the Hotel De Soto, St. Louis, May 17, at 12:30 p. m.

Foundation Invites Applications for Grants.—The Dazian Foundation for Medical Research, recently established in accordance with the will of the late Henry Dazian, New York (THE JOURNAL, January 21, page 251), is prepared to award fellowships to graduates in medicine for graduate study and research and grants to laboratories, hospitals and similar institutions for research in medicine. Applications and inquiries should be addressed to the Secretary, 180 East Sixty-Fourth Street, New York. The board of directors of the foundation is as follows: Drs. Emanuel Libman, New York, president; Israel Strauss, New York, vice president; Philip Finkle, New York, secretary; Harrison S. Martland, Newark, N. J.; Mr. Emil Friedlander, assistant secretary and treasurer; Mr. William W. Cohen, treasurer, Mr. Alfred L. Rose and Mr. Harold Williams.

Dr. Jelliffe Honored.—The April issue of the *Journal of Nervous and Mental Diseases* is a special anniversary issue commemorating the thirty-fifth year of editorship of Dr. Smith Ely Jelliffe. Commemoration exercises and a dinner were held at the New York Academy of Medicine, April 22. The issue contains reviews of the different phases of Doctor Jelliffe's work, as well as scientific articles. The contributors are Drs. Adolf Meyer, Baltimore, Frederick Tilney, George Draper, New York, Earl D. Bond, Philadelphia, Oskar Diethelm, New York, Abraham A. Brill, New York, Karl A. Menninger, Topeka, Kan., Henry A. Riley, New York, Richard H. Hutchings, Utica, N. Y., and Louis Casamajor, New York. The committee of organization of the ceremonies comprised Doctors Brill, Menninger and Riley, and Drs. Iago Galdston, New York, Bernard Glueck, New York, Benjamin Karpman, Washington, D. C., and Gregory Stragnell, Bloomfield, N. J. The concluding article is entitled "The Editor Himself and His Adopted Child." This is followed by Doctor Jelliffe's bibliography, compiled year by year since 1890 making a total of 411 references.

Survey Office to Be Moved.—Headquarters of the Mental Hygiene Survey Committee, supported by a group of organizations, will be moved July 1 from New York to the U. S. Public Health Service headquarters in Washington in order that the committee's work may be coordinated with that of the mental hygiene division of the service. Offices of the survey committee have been in connection with the National Committee for Mental Hygiene and the work has been carried on with funds provided by the Rockefeller Foundation, the American Psychiatric Association and the public health service. Dr. Samuel W. Hamilton is medical director and Dr. Grover A. Kempf of the public health service is associate medical director of the committee, which was formed in 1936 to survey as many as possible of the 336 mental hospitals in the United States and Canada, to promote research and to encourage wider distribution of teaching facilities. One hundred and sixty-nine institutions in forty states have already been surveyed. Organizations represented on the committee are the American Psychiatric Association, the American Neurological Association, the American Medical Association, the American Board of Psychiatry and Neurology, the National Committee for Mental Hygiene, the U. S. Public Health Service and the Canadian Medical Association.

Societies for Experimental Biology.—The annual meeting of the Federation of American Societies for Experimental Biology will be held at the Royal York Hotel, Toronto, Canada, April 26-29. The federation represents the American Physiological Society, the American Society of Biological Chemists, Inc., the American Society for Pharmacology and Experimental Therapeutics, Inc., and the American Society for Experimental Pathology. A joint session will be held Thursday morning with the following speakers:

Dr. Eugene M. K. Geiling, Chicago, The Comparative Pharmacology of the Pituitary.
Dr. Maurice S. Jacobs, Philadelphia, Hemolysis, Cell Permeability and Cell Specificity.
Albert Baird Hastings, Ph.D., Boston, Recent Observations on Electrolyte Distribution in Tissues and Body Fluids.
Dr. Thomas M. Rivers, New York, The Nature of Filtrable Viruses.

The physiologists will discuss, among other things, the nervous system, the heart and the circulation, endocrines and metabolism, the digestive secretions, sex hormones, insulin, vitamins and absorption, pituitary, thyroid and thymus, gastrointestinal motility and the liver and the pancreas.

Morton A. Rubin, Ph.D., and Dr. Harry Freeman, Worcester, Mass., Brain Potential Changes During Cyclopropane Anesthesia.
Dr. Kenton R. Phelps, Cleveland, A New Method for the Gradual Occlusion of Coronary Arteries.
Dr. Reginald A. Shipley, Cleveland, The Effect of Anterior Pituitary Injections on the Blood Acetone Bodies of Adrenalectomized Rats.
Dr. Hance F. Haney and Willard C. Roley, B.S., Portland, Ore., Effect of Bile on the Secretion of the Small Intestine.

A joint symposium on chemotherapy will be held by the biochemists and pharmacologists with the following speakers:

Michael Heidelberger, Ph.D., New York, The Scientific Background of the Use of Rabbit Antibody in Pneumonia.
Dr. Eli K. Marshall Jr., Baltimore, Bacterial Chemotherapy with Sulfanilamide-Type Compounds.
George W. Raiziss, Ph.D., Philadelphia, Antipneumococcic Effect of Sulfapyridine and Related Compounds in Mice.
Leonard H. Cretcher, Ph.D., Pittsburgh, Structure and Antipneumococcic Activity in the Cinchona Series.

Among the pharmacologists on the program are:

H. J. White, Baltimore, Relationship Between Temperature and the Streptococcidal Activity of Sulfanilamide and Sulfapyridine in Vitro.
Charles R. Linegar, Ph.D., Washington, D. C., Effect of Ergotamine on the Hemodynamic Actions of Acetylcholine.
Frank W. Maurer, Ph.D., Washington, D. C., Further Studies of the Ganglionic and Peripheral Actions of Physostigmine.
Dr. Albert G. Young and Frederick F. Yonkman, Ph.D., Boston, Ethyl Yohimbine in Experimental Hypertension.

Included in the many papers on pathology will be:

Drs. Owen H. Wangensteen and Clarence Dennis, Minneapolis, Experimental Proof of the Obstructive Origin of Appendicitis in Man.
Dr. Marian W. Ropes, Dr. Walter Bauer and William V. B. Robertson, Boston, Enzymatic Hydrolysis of Mucins by a Bacterial Enzyme and by Vitamin C.
Louis D. Greenberg, Ph.D., and Dr. James F. Rinehart, San Francisco, The Stability of Ascorbic Acid in Blood.
Dr. Granville A. Bennett and Morris F. Shaffer, Ph.D., Boston, The Passage of Type III Pneumococci from the Blood Stream into the Joints and Certain Other Body Cavities of the Rabbit.

The pathology section will hold a joint symposium with the immunologists Thursday. Friday there will be a symposium on the chemistry and physiology of red blood cells and on the chemical reactions of vitamins in vivo. The pharmacologic society will conduct a symposium Friday on the mechanics of respiration. Other symposiums include those on proteins, the synapse and carbohydrate metabolism. The annual dinner will be Friday evening.

Government Services

New Veterans' Hospital

President Roosevelt approved a site at Marion, Ill., April 11 for construction of a $1,400,000 veterans' hospital to serve downstate Illinois, southern Indiana and western Kentucky, it was reported. The new hospital will have accommodations for 500 veterans, including 350 domiciliary patients and 150 receiving hospitalization treatment.

White House Conference on Children

A White House Conference on Children in a Democracy is being organized with President Roosevelt as honorary chairman, Secretary of Labor Frances Perkins as chairman and Miss Katherine F. Lenroot, chief of the Children's Bureau, U. S. Department of Labor, as secretary. The first session will be held at the White House April 26 and the last early in 1940, according to an announcement. Among physicians on the planning committee are Drs. Fred L. Adair, Chicago; Clifford G. Grulee, Evanston, Ill.; Henry F. Helmholz, Rochester, Minn.; Felix J. Underwood, Jackson, Miss.; Midian O. Bousfield, Chicago, and James S. Plant, Newark, N. J.

Foreign Letters

LONDON

(From Our Regular Correspondent)

March 25, 1939.

X-Ray Examination in Acute Diseases of Respiratory Tract

At the section of radiology of the Royal Society of Medicine, Dr. Peter Kerley opened a discussion on x-ray examination in acute diseases of the respiratory tract. A portable apparatus was generally necessary. Fine detail was rarely required and speed was important. A working distance of from 2½ to 3 feet was ample. His usual procedure was to let the patient lie back against the screen in the sitting posture. When the shadow of a consolidated base merged with that of the diaphragm or when the respiratory rate was too high or the patient too young or too ill to cooperate, a screen examination might be decisive. As to films, his advice was to take plenty and to overexpose or overpenetrate, since the presence of fluid and consolidation might then be differentiated. A lateral view should always be taken.

The best recognized though not the commonest acute disease of the respiratory tract in childhood was miliary tuberculosis. In infants under 9 months old the usual appearance was a large caseating area of pneumonia in one lung with round foci all over both lung fields; in older children and adults there was a widespread infiltration of millet seed size or larger shadows but seldom a pneumonic area. The significance of the size of the lesions was not clearly established, but he did not believe that the finer and more discrete the lesions the better the prognosis, as had been stated by some authorities.

In pneumonia infants tended to show localization to the paravertebral sulci and older children a more diffuse type of shadow. The dominant feature in infants was a dense homogeneous opacity with an outer border running parallel to the mediastinum from apex to base. The homogeneity of the shadow, the sharp outer border and the distribution transgressed the lobar divisions of the lung and indicated a mediastinal effusion, which appeared to be a frequent complication of paravertebral pneumonia in young children. Between the ages of 2 and 10 years two types of bronchopneumonia could be recognized. In one the foci were large and ill defined and might coalesce but did not extend into the root of the lung, as in lobar consolidation; in the other the foci were sometimes described as miliary bronchopneumonia and appeared to be common after measles. The complications of bronchopneumonia and lobar pneumonia in children were collapse and the presence of fluid. The former could be detected by the low position of the interlobar fissure, the opacity of the lobe and the displacement of the mediastinum to the diseased side. Fluid could be localized, but the roentgenogram did not show whether it was purulent or not. In young children mediastinal effusions were frequent, while in older children the ordinary axillary type was commoner. Empyemas occurred in odd situations and might be overlooked, and sometimes pseudocavities due to acute vesicular emphysema occurred both with lobar pneumonia and with bronchopneumonia in children. All these conditions were difficult even for a skilled radiologist to interpret, and roentgenograms taken by a layman and interpreted by a general practitioner might lead to disastrous results. Ring shadows or pseudocavities in the roentgenograms in cases of lobar pneumonia had been described by American writers and regarded as areas of aseptic necrosis. Rabin regarded them as due to arteritis with thrombosis and infarction. They were a purely radiologic discovery and had never been confirmed post mortem. They might be due to delayed resolution following collapse of a large segment or lobe. Emphysema was a natural reaction to collapse, and there was no reason why overdistended lobules should not contain fluid levels. In cases of influenzal bronchopneumonia the appearances suggested an area of intense hyperemia with pea-sized foci of consolidation not tending to coalesce.

PARIS

(From Our Regular Correspondent)

March 18, 1939.

Increase in Alcoholism

An article by Dr. G. Lavallée of Paris, which appears in the March 11 *Concours médical*, is entitled "France, the Country of Alcoholism." During the World War some vigorous measures were taken by the government to suppress the sale of absinth and to limit the number of saloons. Although the manufacture of absinth is prohibited, 2,000 new saloons were licensed in 1933. Two years later, distillers of 96 per cent alcohol were given privileges in the way of reduced taxes. This was followed by a rapid increase in the total quantity distilled, so that the population is drinking more and more beverages containing as high as 50 per cent alcohol. The Académie de médecine passed resolutions in 1936 calling the attention of the government to the dangers incident to the increase in drinking and especially to the number of workers who, instead of being benefited by a reduction in the number of working hours to forty a week, were spending their leisure time in saloons. Professor Née of Rouen, in a French department where drinks containing even more than 50 per cent alcohol are commonly taken, stated that at the Hôtel Dieu of that city 220 cases of delirium tremens had been treated from 1935 to 1937 with a mortality of 56 per cent. Many of these patients were not employed and received a daily allowance from the government, most of which was spent in saloons. The Rouen Medical Society at a recent meeting urged the government to take steps immediately to cut down the number of saloons, regulate the manufacture of alcoholic drinks and close the saloons during certain hours as in England and Germany. The production of alcohol has increased from 940,000 hectoliters in 1850 to 4,772,110 in 1935. During the same period, importation of alcohol rose from 5,555 to 692,376 hectoliters. In 1914 only 1,415,000 hectoliters of alcohol in some form was drunk, as compared to 6,149,571 hectoliters in 1935. The net income of the largest two firms engaged in making alcoholic beverages in France has increased 63 per cent and 53 per cent in 1936 as compared to 1935.

Tetanus and Tetaniform Syndromes

The report of cases of tetanus following laparotomy or as a complication of the puerperium often raises the question both as to the atrium of infection and whether the clinical picture corresponded in every detail to that which it is customary to associate with an infection by the tetanus bacillus. This question was raised by Dr. Pierre Lombard, who read a paper at the January 31 meeting of the Académie de médecine. He stated that patients are admitted to hospitals whose clinical symptoms correspond in every detail to the classic picture of tetanus and yet who show no wound to explain the entrance of the toxin into the body. According to Dr. Lombard there are a number of tetaniform states which cannot be differentiated from tetanus of infectious origin. If a wound is present as a potential atrium, inoculation of some of the excised tissue into guinea pigs is a far more certain method of finding the tetanus bacillus than cultures. The author reported six cases of children in whom the clinical picture was typical for tetanus and yet animal inoculations were negative. In five of the children only a small superficial abrasion of the skin of some portion of the lower extremity could be found. In the sixth no skin abrasion or other evidence of recent or older injury

could be found. The patient, a boy aged 9 years, complained of a severe pain in the back, which had begun suddenly and subsided as rapidly. Four days later, recurrence of the pain in the back was accompanied by abdominal pain and rigidity of the arms and legs. Two days subsequent to another attack, the child was sent to the hospital with a diagnosis of tetanus. Every five minutes, typical tetanic contractures of the muscles of the lower extremities and abdomen with marked opisthotonos were observed. These attacks did not cease in frequency until large doses of parathyroid extract were given. About three weeks after admission to the hospital there was complete cessation of the tetaniform syndrome.

Primary Tuberculous Infection Reproduced in Monkeys

An important contribution to the method in which children are primarily infected by the tubercle bacillus was reported at the February 14 meeting of the Académie de médecine by Prof. Jean Troisier and Miss Sifferlen. In preliminary experiments they found that when a drop of a culture of tubercle bacilli was instilled into the nose of mice previously anesthetized with ether the acid fast bacilli could be found within three minutes in the pulmonary alveoli. Two minutes later, some of these bacilli were found within the alveolar monocytes even before any phagocytes were visible. For a second series of experiments, monkeys were employed. In animals infected by this method, pathologic changes were found at the end of from one to two months which corresponded in every detail to those observed in primary tuberculous infection of infants. In the lungs, the changes are in general found in the middle and inferior lobe on the side where the bacilli were instilled into the nose. The pulmonary lesions are the size of a pea but are accompanied by a caseous involvement of the tracheobronchial lymph nodes. Although no macroscopic signs of involvement of other viscera exists, their inoculation into guinea pigs shows that the tuberculous infection is a generalized one. These experiments were undertaken with the object of proving that infants in contact with tuberculous individuals can during sleep be infected through inhaling air containing tubercle bacilli.

Graduate Courses in English at Paris Hospitals

The faculty of the medical school of the University of Paris in collaboration with the Association des relations médicales and American Medical Society of Paris has organized graduate medical courses given in English. The cost is generally $6 a lesson, whether taken privately or in a group, and, if there are six students, each one will pay $6 for the entire course. Special arrangements can be made for courses exceeding a week. Courses in dissection may also be arranged. All graduates will be able, without additional charge, to witness operations or accompany the attending physicians or surgeons of the Paris hospitals on daily ward walks. Daily bulletins, similar to those employed in the larger medical centers of the United States, announce the operations to be performed at about twenty hospitals. These bulletins can, on request, be sent by special delivery to the hotel or boarding house where the graduate is stopping or to the Cité universitaire (Maison américaine), where lodging and meals can be secured at very moderate rates. Thus the graduate can plan his program for the following day, having received the bulletin the preceding evening. The medical school of the University of Paris will grant certificates for graduate work of not less than two months' duration. Arrangements can be made by writing to A. D. R. M. (Salle Béclard), Faculté de médecine, 12 rue de l'Ecole de médecine, Paris, for private courses in English in rheumatology, otolaryngology, infantile neuropsychiatry, endocrinology, cystoscopy and urethroscopy, neurology, operative technic, parasitology, cardiovascular diseases, pulmonary tuberculosis, gastro-enterology and pediatrics. This is the first time that a systematic effort has been made here to give graduate courses in English. The clinical material and laboratories are equal if not superior to those accessible to graduates in other parts of continental Europe. The professors giving these courses include many physicians of international reputation.

BERLIN

(From Our Regular Correspondent)

March 6, 1939.

The Development of Bronchoscopy

"Forty Years of Bronchoscopy" is the title of a lecture delivered before the Berlin Medical Society by Professor von Eicken, Berlin ordinarius in otorhinolaryngology. His teacher, Professor Killian, was really the founder of this method. Eicken too, as successor of Killian, has participated in the development of the bronchoscopic technic. After the invention of the laryngoscope by Garcia in 1854, a tube was first introduced into the esophagus by the clinician Kussmaul in 1867. In the exercise of this method one of Kussmaul's pupils placed the tube too far forward and observed the bifurcation of the bronchi. Warnings against introduction of tubes into the respiratory tract were quite common at that time. First in 1897 Killian, then at Freiburg-in-Breisgau, made a practical application of his theories: by means of a specially constructed esophagoscope he removed an aspirated bone from the trachea. Thereafter other interventions of this type were made. The attempt was also made to advance a tracheotomy opening and thus to reach as far as the right inferior lobe. But the direct oral method came to be carried on only after step-by-step perfection of the instrumentation had taken place. In the year 1906 Professor von Eicken himself, who had for long collaborated with Killian, was able to report on 600 successful removals of foreign bodies from the respiratory passages. As the method developed, the attendant difficulties multiplied. In time the profession, growing better acquainted with bronchoscopy, came to recognize that, if an aspirated body could not be quickly removed by the general practitioner, the patient should as soon as possible, namely within the first few hours after aspiration, be placed in the care of a specialist skilled in bronchoscopic technics. At present bronchoscopy is almost an everyday operation; removals of foreign bodies are reckoned in tens of thousands. According to the latest American contributions, however, the removal of foreign bodies represents but a small fraction of the interventions for which bronchoscopy is indicated. In America the method is above all used in the abolishment of postoperative pneumonia. If signs suggestive of pneumonia appear during the first postoperative days, coagulum and mucus are removed with the aid of the bronchoscope and the patients are thus spared the dreaded pneumonic complication. In conclusion von Eicken pointed out that the dense shadows in the roentgenogram after aspiration of foreign bodies may be mistaken for signs of pneumonia. Foreign bodies may produce not only atelectasis but in addition a serous exudation in the alveoli and a venous congestion that is often of high grade. The heavy shadows are based on the sum of these phenomena. The amazingly rapid clearing of the lung picture (often within a few hours) after removal of the foreign body may be explained as due to speedy resorption.

Research on the Pathology of the Liver

Professor Nonnenbruch, Prague ordinarius in internal medicine, discussed his investigations on hepatic disease before the Frankfort Medical Society. Continuous checking of the residual nitrogen provides a good measuring rod of the course of the illness. Urea and residual nitrogen maintain an interrelation in that the latter diminishes as the urea is increased by oral administration of urea or because of renal insufficiency. Liver extracts can produce the same results; urea is therefore a therapeutic agent capable of promptly abolishing a hepatargic

condition. Residual nitrogen, however, provides no clue to the secret of a coma hepaticum that is unaccompanied by increase in residual nitrogen and rest nitrogen. Coma hepaticum is not accompanied by any characteristic blood picture. Frequently a renal insufficiency participates in this condition; the urea then rises to a high level. In other cases there is a greater increase in residual nitrogen. Many times the potassium values in the blood and the cerebrospinal fluid are greatly elevated, a sign of the subsidence of so-called regulated permeability; but cases of coma hepaticum are occasionally seen in which the potassium value in the serum remains normal. In one case in which massive intravenous injections of dextrose solution were exhibited a "water intoxication" was manifested. Like uremia, coma hepaticum is not to be interpreted in terms of one specific toxin but rather represents a complex of disturbances. The following primary classification may be made on the basis of the blood chemistry: (1) coma hepaticum with increase of the residual nitrogen only (amino-acidemia, azotemia II), (2) hepatorenal coma with azotemia III and (3) coma without azotemia and without significant phenomena in the blood chemistry.

A New Type of Balneotherapy

As every one knows, a search is in progress throughout Germany for new materials that lend themselves to utilization as substitutes. In this connection the following new type of balneotherapy is reported: At Ziegenhals, a small Silesian watering place, so-called wood-pulp slurry (holzschlamm) has been used as a bathing medium for some time. This slurry is a by-product of paper making. The municipality of Ziegenhals has applied to the national patent office for a protective patent of this therapy in the hope that in future the town will be the only place in Germany where visitors with rheumatism and sciatica can be treated with pulp-slurry baths. Last year 5,200 baths of this type were administered. Since Ziegenhals expects a much greater influx of patients during the current year, and since the present accommodations are no longer adequate, a new bath house is to be constructed equipped with at least ten cabinets and having a capacity of from eighty to a hundred baths daily. From the standpoint of economics it is also an interesting fact that the same slurry in which the patients bathe can again be utilized in the manufacture of paper. The foregoing notice is thus far the only extant news with regard to the new use of wood-pulp slurry. No clinical report has been published to date although the new method has received mention in medical journals.

The Nursing Sisters and Tuberculosis

Extensive recent examinations of more than 40,000 members of the nursing sisterhoods have demonstrated that the profession of nursing sisters, despite the fact that its members are exposed to greater dangers than most professionally active women, still is characterized in all parts of Germany by favorable expectation of life. However, in view of the increasing number of occupational illnesses on a tuberculous basis, especially among youthful employees of the tuberculosis wards of hospitals, the establishment of a minimum age limit for permission to work among tuberculous patients has been deemed expedient. Accordingly the accident prevention code of the association of health and welfare employees has been supplemented by a new stipulation to the effect that the care and surveillance of actively tuberculous patients should be entrusted only to healthy persons, capable of resisting infection, who are not less than the age of 25 years. It is also stipulated that the attending physicians and any other persons whose occupation requires contact with tuberculous patients must be in good health and not likely to become infected. The fixing of the age limit at 25 was dictated primarily by the consideration that initial infection with tuberculosis is not only much rarer after the twenty-fifth year of life, but is usually of a milder character, if acquired.

AUSTRALIA

(From Our Regular Correspondent)

March 14, 1939.

Australian and New Zealand Association for the Advancement of Science

The recent meeting of the Australian and New Zealand Association for the Advancement of Science was in part reported in THE JOURNAL April 15, page 1520. An illuminating contribution to the medical section was a joint discussion on virus diseases. The discussion centered largely round the controversy as to whether viruses are to be considered independent living organisms or not, and proceeded along two main lines, one suggested by Dr. F. M. Burnet, who has done research on animal viruses at the Walter and Eliza Hall Institute, Melbourne, the other by R. J. Best, M.Sc., of the Waite Agricultural Institute, Adelaide.

Dr. Burnet expressed the view that viruses are essentially independent living organisms. He said that with the present definition of viruses as particulate agents of disease smaller than bacteria and susceptible of being grown only on living cells of a host, it was difficult to believe that there were any natural biologic divisions among the micro-organisms of disease. Certain strictly parasitic bacteria could not be grown apart from living cells, while among the larger "true" viruses were many features of resemblance to bacteria. The nature of viruses could be examined from three points of view: 1. Physicochemical: Complete physicochemical formulation of even the simplest virus was not likely to be attained. 2. Pragmatic: An approach could be made by seeking the working hypothesis best suited to the practical needs of the virus, the research worker, the clinician and the veterinary or plant pathologist. 3. Evolutionary: Here there were three possibilities: (*a*) the virus was a pathologically active fragment of the cell it parasitized, (*b*) it represented a surviving form of a precellular stage of evolution or (*c*) it was a specialized or degenerate descendant of a larger parasitic micro-organism. This third hypothesis seemed to him most likely to be true. It provided an explanation of the graded series from bacteria to the smallest viruses. It was well known that the more highly parasitic bacteria were harder to grow in vitro, produced more specific types of disease, and showed a greater tendency to intracellular growth. The rickettsias were almost certainly derived from bacteria which had developed a symbiotic habit in arthropods. With development of complete parasitism, viruses had lost to a greater or less extent their complement of enzymes and now made use of the enzymes and activated molecules of the host cell. The types of virus now in existence represented various stages in this process of parasitic degeneration.

R. J. Best subscribed rather to the view that viruses represented a surviving form of primordial living matter. He showed that many plant viruses and at least one animal virus had been isolated as proteins and that virus particles had now been obtained which were actually smaller than some protein molecules. While it had not yet been shown that virus properties were not due to some impurity of the protein crystals obtained, this now seemed unlikely. He expressed the view that whereas the protein itself when isolated did not show properties particularly different from any other protein body or phenomena to suggest that it was living, nevertheless when placed in a suitable environment the protein in that environment constituted an independent living system which metabolized and developed at the expense of the normal metabolism of its host and that in such an environment the virus protein reproduced itself at the expense of the energy of its host cell. Countering the argument that such a conception presupposed a higher stage of evolutionary development in the environment and so eliminated the possibility that viruses might represent a primordial form of life, Best replied that viruses were now

recognized only by their biologic activity in their host organism. This did not preclude the possibility that virus proteins existed at the present time in non-living environments since, if they did so, there was no method of recognizing their existence. He concluded by saying that viruses, being a group of living molecules intermediate between the macromolecules of the chemist and the micro-organisms of the biologist, much cooperative investigation from the physical, chemical and biologic aspects was required to elucidate their nature.

TISSUE SPECIFICITY OF INFLUENZA VIRUS

The tissue specificity of influenza virus was discussed by Dora Leish, M.Sc., of the Walter and Eliza Hall Institute, Melbourne. Many viruses, of which the influenza virus was a good example, were rather strictly limited to one particular tissue, in this case the lining of the respiratory tract. This tissue limitation was also shown when the virus was grown on embryonic organs. Influenza virus grew best in the lung of chick and guinea pig embryos, although innocuous to the adults of these species. The more embryonic the tissue, the wider the range of organs that would allow growth. Studies of this kind might throw light on the nature of the interaction between virus and susceptible cell.

PRINCIPLES AND TECHNIC OF PUBLIC EDUCATION

Dr. N. M. Gutteridge, lecturer in bacteriology, University of Queensland, said that the constructive possibilities of science were not fully utilized by the existing social organization, although its destructive possibilities were only too hastily developed. Where science tended to fall short was in its failure to control the interpretation of its advances and their application to society. In modern science lay the hope of civilization, but before society could derive full benefit from the discoveries of science it must find a way of spreading scientific information geared down to the layman's power of understanding. Dr. Gutteridge stressed the growing significance of public education especially in the field of constructive medicine. Unfortunately, the agencies playing the greatest part in public education today were commercial advertising and the films. Between the two a colossal and unremitting pressure was brought to bear on the public mind, and the advent of organized education in fields such as nutrition and physical education had to contend with this pressure. To develop an enlightened public opinion, we had to learn to speak a new language in order to compete with those other influences dominated by commercial interests. That language must be a dramatic rather than a rational one, and the appeal must come as much through emotion as through reason. The process was largely one of interpretation, and in it well developed radio and film technic could prove a valuable medium. This statement was illustrated by means of the British nutrition film entitled "Enough to Eat" and a dramatized broadcast on nutrition.

HEALTH EDUCATION IN QUEENSLAND

Dr. Gutteridge then described the active public education campaign which had been carried on in Queensland over the the last three years under the egis of the Queensland Nutrition Council. Dramatized broadcast sessions on nutrition, on lines similar to those of the health talks conducted by the American Medical Association, had been broadcast regularly twice a week. Frequent articles had appeared in the metropolitan and country press, as well as a six page annual nutrition supplement in the *Courier Mail*. The council had published a "menu-planning chart" and a year book, each of which had been widely distributed, and several courses of lectures on everyday nutrition had been arranged. A weekly dramatized broadcast entitled "Healthward Ho!" had the approval of the Queensland branch of the British Medical Association, and a further weekly session, entitled "The Fitness Forum," dealt with the subject of physical education. Each of these sessions embodied the modern technic of dramatization. The work had been placed on a sound financial basis by enlisting the support of approved advertisers such as pasteurized milk companies. Already the effect of this education had been noticed in the changing food habits of Queensland people. Reliable figures were difficult to obtain, but commercial companies concerned reported a considerably increased demand in milk, fruit and salad vegetables as well as a specially prepared wheat germ bread over the last two years.

BUENOS AIRES

(From Our Regular Correspondent)

Jan. 1, 1939.

National Congress of Medicine

The sixth National Congress of Medicine took place at Córdoba Oct. 15-21, 1938. This congress meets once every four years. It is organized in several sections, which embrace the various branches of medicine. The general topic was "Organization of Public Health in Argentina." The advisability of making the various departments of public health only a body with a central board of directors was shown. Drs. G. N. Martínez, Gregorio Aráoz Alfaro, E. Bullrich, A. Bidau, Pedro Escudero, Alberto Zwanck and Alfredo Sordelli were speakers.

"Arterial Hypertension" was the topic discussed in the section on internal medicine. Profs. Franz Volhard of Frankfort, Carl J. Wiggers of Cleveland, Gregorio Marañón of Madrid, B. A. Houssay of Buenos Aires and G. N. Martínez, Temístocles Castellanos and Ramón Brandán of Córdoba were speakers. In the section on dermatology the immediate establishment of regional leprosariums was advised, and the speakers favored the support of the laws concerned with abolishing the recognition and regulation of prostitution. The main topics discussed in the sections on physiology and pharmacology were, respectively, "Sounds of the Heart and Electrical Phenomena of Nervous Energy" and "Agents for Chemical and Sympatheticolytic Transmission."

Annual Congress of Surgery

The Congreso Argentino de Cirugía held its tenth annual reunion Oct. 9-15, 1938, in Buenos Aires with Prof. J. M. Jorge as president. Among the surgeons present were Drs. Brandão, A. Monteiro, J. Poggi, M. Gudin, O. Gualberto, E. Linz, M. de Andrade and Aresky Amorim of Brazil; Luis Vargas Salcedo, E. Patermann, D'Alessandri, A. Bahauser, Fernández and Vargas Molinare of Chile; J. Mussio Fournier, A. Navarro, D. Pratt, C. Nario, C. Stanjano, V. Armand Ugon and E. Palma of Uruguay; C. R. Gagliardone of Paraguay, and A. Parada of Bolivia. South American surgeons consider it regrettable that North American surgeons do not attend this yearly congress. They would bring important contributions to the congress and at the same time see the progress made by the surgeons of South America.

HYDATID CYSTS

Prof. Oscar Ivanissevich spoke on the first topic, "Hydatid Cysts of the Lung." He advised artificial pneumothorax before the operation when the cyst is small and uninfected. The cyst is slowly evacuated to prevent its rupture in the bronchi or in the pleura. Ninety-two patients with hydatid cysts of the lung underwent operation at the Instituto de clinica Quirurgica, of which Professor Ivanissevich is a member, and the mortality rate was from 14 to 19 per cent. In ten cases cough or hemoptysis followed the operation. In fifty-five cases residual cavities of the lung were visible on x-ray examination.

MALIGNANT BONE TUMORS

Prof. Oscar Copello introduced the second topic, "Malignant Bone Tumors." He had adopted the Kolodny classification and discussed fifty-three cases, which included thirty of osteogenic

sarcoma, twelve of Ewing's tumors and twenty-one of metastatic tumors. He advised combined surgical and roentgen treatment. Profs. José Guardado and Diego Brachetto-Brian discussed the subject from roentgenologic and anatomopathologic angles.

Diminution in Birth Rate

The birth rate has diminished in Argentina, which is the richest and most prosperous country in South America. From 1887 to 1900 there were forty births for each thousand of population and from 1901 to 1914 thirty-five. The birth rate has diminished still more since the World War. In 1937 there were sixteen births for each thousand of population. In the last few years Buenos Aires, with a population of 2,400,000, has shown an alarming diminution in birth rate.

Personals

Drs. F. Arrillaga, Guillermo A. Bosco, José Valls and R. F. Vaccarezza have been appointed to the chairs of clinical medicine, semeiologics, orthopedics and tuberculosis of the Faculty of Medicine of Buenos Aires.

Drs. P. I. Elizalde and Gonzalo Bosch have been appointed members of the Academia Nacional de Medicina of Buenos Aires.

Drs. E. del Castillo, Alfredo Biasotti, Leopoldo Giusti, Gregorio Aráoz Alfaro and O. Orías were appointed official representatives of Argentina to the first South American Congress of Endocrinology at Rio de Janeiro.

Lectures

The following lectures have been delivered in Buenos Aires: Profs. F. H. Quix of Utrecht on the labyrinth; G. Duval of Paris on surgery; Georges Dumas of Paris on psychology; Cesare Frugoni of Rome on medical clinics, Franz Volhard of Frankfort on renal diseases; Paul Hübschmann of Düsseldorf on pathologic anatomy of tuberculosis; Carl Wiggers of Cleveland on fibrillation, resuscitation and hypertension; H. Arruga of Madrid on detachment of retina; Pedro Ara of Madrid on conservation of anatomic preparations, and Antoine Alajouanine of Paris on neurology.

BUDAPEST

(From Our Regular Correspondent)

March 19, 1939.

Poisoning with Caustic Potash

Dr. G. Faludi reported at a recent meeting of the Interhospital Association on his experience with children suffering from poisoning with caustic potash. Over a period of twenty-three years he treated in the children's wards of St. Stephen's Hospital 1,722 such patients, of whom 938 had acute intoxication and 784 were suffering from esophageal stricture. Of these patients 55.40 per cent were boys and 44.60 per cent girls; 60 per cent were from 1 to 3 years old. Of those with acute intoxication 19.19 per cent died, and of those suffering from stricture 13.40 per cent died. Of those with acute intoxication who died, 83.33 per cent died within three days after admission to the hospital. Ninety-eight per cent of all intoxications were the result of accidents, 1 per cent were suicide and 1 per cent were murder. Strictures most frequently occurred in the middle and the lower third of the esophagus. Dilation with the esophagoscope is not without danger. During the course of the twenty-three years Dr. Faludi met with twenty-six artificial perforations of the esophagus, of which five had occurred before the patient was admitted to the hospital. Early use of the sound must be resorted to with children. It is regrettable, said Faludi, that this method is not as extensively adopted as it deserves, because with it the most severe strictures can be successfully treated. For severe strictures not adapted to treatment with regular sounds, he used Hacker's retrograde treatment with a thread, preceded by gastrostomy. This treatment sometimes takes years, but even in cases of severe stricture it is conducive to good results.

As treatment is at best unsatisfactory, prevention is most important. This can be accomplished only by applying drastic measures to exclude from households the use of caustics. It is not an uncommon experience for a mother to put the caustic, which resembles sugar cubes, into a tumbler of water beside the wash tub and then go to the kitchen to see about cooking the dinner. The small child, seeing the sugar-like thing in the tumbler, drinks it. Such mishaps ten years ago were of daily occurrence. Now, through radical changes in packing the caustic, drastic restriction as to its sale and wide enlightenment of the public, the rate of accidents is decreasing; nevertheless, at present Hungary leads in the frequency of caustic intoxication. Faludi appeals to the government to stop the sale of caustic potash.

The Sense of Taste

Dr. Harald Tangl, lecturer at the University of Budapest, in a paper on the sense of taste said that taste is a regressive sense in man, as he tastes only with his tongue while some animals, e. g. fishes, taste with their whole body. An infant tastes with the middle part of his tongue and an adult determines with the sides of his tongue whether food is pleasing or not. The whale has very few taste buds and gulps its food so quickly that it does not bother about the taste. Among horned cattle, taste is important, and they scrupulously select the grasses they like. The cow has about 15,000 taste buds, the antelope 50,000 and man 3,000.

We know four distinct tastes: sweet, salty, bitter and sour. The sweet taste is perceived on the tongue the quickest, because the buds reacting on sweets are located at the tip of the tongue; then comes salty and then sour taste. Bitter things are tasted at the back of the tongue. Taste can be regulated. Warm coffee requires less sugar than cold, because warmth is a stimulant to the taste buds. However much sugar is put into ice cream it will not seem too sweet, because when cooled the taste buds scarcely function. If the tongue is rubbed with ice, one fails to perceive different tastes, a good method in taking bitter drugs. Taste is such a fine sense that it cannot be overtaken by chemical procedures. The taste can be trained. Tea tasters are able to tell the place of origin of a tea after a single tasting. Wine tasters can tell from where a certain variety of wine came and also whether the grapes from which it was made grew in a sunny or a shady field.

Marriages

ELIZABETH WASHINGTON KIRBY-SMITH, Sewanee, Tenn., to Mr. David Culbreth Clough of Dover, Del., January 7.

THOMAS EDWARD CAULFIELD JR., Woburn, Mass., to Miss Mary Smith Carroll of Gloucester, Nov. 26, 1938.

THOMAS EDMOND HUGHES, Richmond, Va., to Miss Mary Elizabeth Warren of Delaplane, February 23.

KENNETH L. CARTER, St. Louis, to Miss Frances Elizabeth Ritter of Mattoon, Ill., in December 1938.

DAN ARTHUR JARDINE, Douglas, Ga., to Miss Charlotte Williams of Haddock recently.

DEANE C. EPLER, Detroit, to Miss Kathryn Louise McNeil of Tiffin, Ohio, Nov. 10, 1938.

ROLF VAN K. EGGERS, Seattle, to Miss Kathryn Johnson of San Francisco, Nov. 5, 1938.

RICHARD VINCENT EBERT to Miss Virginia Bordeau Benjamin, both of Boston, recently.

CALVIN G. JACKSON to Miss Mary Lou Johnson, both of Kenton, Ohio, in January.

CLAUDE R. G. FORRESTER to Miss Ruth Emma Johns, both of Chicago, January 5.

Deaths

Alfred Stengel ⊕ distinguished physician of Philadelphia and distinguished equally as a medical writer and educator, died at his home in Philadelphia, April 10, aged 70. He had been associated with the University of Pennsylvania as a teacher and administrator for forty-six years.

Dr. Stengel was born in Pittsburgh, Nov. 3, 1868. He received his M.D. degree from the University of Pennsylvania in 1889. Soon after graduation he became assistant to Dr. William Pepper. In 1893 he joined the faculty of the University of Pennsylvania as instructor in clinical medicine. In 1896 he became clinical professor of medicine at the Woman's Medical College of Pennsylvania, retaining this position until 1898. He became professor of medicine in the University of Pennsylvania in 1911, and vice president of the university in charge of medical affairs in 1931. In this position he not only supervised the School of Medicine and the Graduate School of Medicine and such auxiliary divisions as the Phipps Institute but also the School of Veterinary Medicine. He was president of the board of the Wistar Institute of Anatomy and term trustee of the University of Pennsylvania, member of the trustees' executive board, and the manager of the Veterinary Hospital.

ALFRED STENGEL, M.D., 1868-1939

In his career in medicine he received many honors, including the honorary degree of doctor of laws from the University of Pennsylvania at the 165th anniversary, the honorary degree of doctor of laws from Lafayette College, and the honorary degree of doctor of science from the University of Pittsburgh.

His literary contributions to medicine were numerous, including "A Text-Book of Pathology" which went to eight editions between 1898 and 1924. He served as editor at one time of the *American Journal of the Medical Sciences* and was a contributor of various sections or volumes in most of the leading systems of medical practice. Dr. Stengel was editor of the American edition of Nothnagel's Cyclopedia of Medicine.

For two terms Dr. Stengel was president of the American College of Physicians and he was a member of the Association of American Physicians, the Philadelphia Pathological Society, and numerous other medical organizations. He was also consulting physician to the Philadelphia General Hospital, the Jewish Hospital, the Abington (Pa.) Memorial Hospital, the Norristown State Hospital, and the Woman's College Hospital. At the time of his death he was actively concerned with the development of a new building for obstetrics and gynecology at the University of Pennsylvania and with new space for a department of neurology.

In the American Medical Association Dr. Stengel served as member of the House of Delegates in 1905 and he had been a member of the editorial board of the *Archives of Pathology*. With his death, medicine lost a great teacher devoted to the highest ideals in the field of medical science, a builder of medical institutions, a man who exemplified in his life and his work the manner in which the physician may contribute in the highest degree to the advancement of his profession.

Angus McLean ⊕ emeritus professor of surgery at Wayne University College of Medicine, died at his home in Detroit on April 11 of carcinoma of the stomach, aged 76. He had a long and distinguished career in the field of medicine and was equally notable for his service as a great citizen of Detroit.

Dr. McLean was born in St. Clair, Mich., April 4, 1862. He graduated from the Collegiate Institute of Strathroy, Ontario, in 1880 and received his M.D. degree from the Detroit College of Medicine in 1886. Later he served in various capacities in the city and state government, holding at different times the position of city physician, quarantine inspector for the Port of Detroit, member of the state board of health and member of the city board of health. In his work in the field of medicine he was past president of the Wayne County Medical Society and the Michigan State Medical Society and was first president of the Detroit Academy of Surgery. He was appointed in 1905 to serve on the state board of health and in 1911 was made a member of the Detroit Board of Health.

During the World War he organized and was commanding officer of the Harper Base Hospital No. 17 in France and was cited for heroic work in the American Expeditionary Forces. He became president of the Medical Commission and was sent to Italy in October 1917. Later he was transferred from hospital duty and appointed special surgeon to the Peace Commission in France. By special order of General Pershing, he accompanied President Wilson on his homeward journey in February 1919. The War Department conferred on him the Distinguished Service Medal. In 1927, he was one of four physicians appointed by President Coolidge to attend the Military Medical Congress at Warsaw, Poland, at which time the President of Poland presented him with a medal on behalf of the Polish Army Officers' Medical School of Warsaw. He was also made honorary professor of medicine by the University of Warsaw.

In 1929, he was one of five physicians appointed by President Hoover to represent the United States in the Fifth International Congress of Military Surgeons at London and at the Royal Institute of Public Health at Zurich, Switzerland. For his work abroad he was recognized by the award of the Chevalier of the French Legion of Honor. He was also made an honorary member of the Federation of Soldiers of France and a member of the Société Française. In 1936, he was awarded the Order of Knight Commander of the Crown of Italy.

Dr. McLean was conspicuous in the general field of education, having been a member of the Detroit Board of Education since 1923, and president of the board in 1935. He served as chairman of the Michigan committee for the relief of German children and was decorated by the German government for this work.

ANGUS MCLEAN, M.D., 1862-1939

In his work in surgery he made numerous scientific contributions to surgical periodicals. He was consulting surgeon to the Children's Free, Woman's, St. Joseph's Mercy, Receiving and Providence hospitals and the Florence Crittenton Home.

Dr. McLean's career was an exemplification of the opportunities that America has offered in the past and how a young man may rise from humble beginnings. His father was a farmer. Dr. McLean, at various times in his career, was a lumber mill employee, a dock hand, a ship's watchman, a Great Lakes sailor and a pilot. He retained his interest in sailing, having his own yacht. He took part in eyery activity for the advancement of his community and for the development of his profession.

William Belfry Hendry, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1904; professor emeritus of obstetrics and gynecology at his alma mater; member of the American Association of Obstetricians, Gynecologists and Abdominal Surgeons and the American Gynecological Society; fellow of the American College of Surgeons, Royal College of Surgeons of Canada and the British College of Obstetricians and Gynecologists; served during the World War; consultant in obstetrics to the Toronto Board of Health and Federal Board of Health; consultant in obstetrics and gynecology to the Provincial Board of Health; on the staff of the Toronto General Hospital; aged 64; died, March 24, of leukemia.

James Francis Lynch ✪ Hartford, Conn.; College of Physicians and Surgeons, Baltimore, 1913; fellow of the American College of Surgeons; aged 46; attending surgeon to St. Agnes' Home and House of the Good Shepherd; consulting surgeon to the Hartford Neuro-Psychiatric Institute and Hospital; consulting supervisor of surgery, Veterans Administration Facility, Newington; attending surgeon to St. Francis Hospital, where he died, January 7, of gastric hemorrhage.

Arthur Daniel Kurtz ✪ Philadelphia; Jefferson Medical College of Philadelphia, 1908; formerly associate professor of orthopedic surgery at Temple University School of Medicine; member of the American Academy of Orthopedic Surgeons; fellow of the American College of Surgeons; on the staffs of the Misericordia Hospital, Jefferson Hospital and the Homewood School; aged 52; died, January 21, of essential hypertension and acute hemorrhagic nephritis.

Francis D. Pringle ✪ Punxsutawney, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1903; past president of the Jefferson County Medical Society; for many years president of the city board of health and of the board of education; for fifteen years county health officer; aged 67; on the staff and formerly superintendent of the Adrian Hospital, where he died, January 29, of uremia.

William Lee Helms, Taylor, Texas; Louisville (Ky.) Medical College, 1904; member of the State Medical Association of Texas; past president of the Williamson County Medical Society; formerly city health officer and member of the school board; on the staff of the Wedemeyer Hospital; aged 68; died, January 2, in a hospital at Temple of injuries received in an automobile accident.

Arthur Guernesey Root, Albany, N. Y.; Albany Medical College, 1890; member and past president of the Medical Society of the State of New York; at one time professor of diseases of the throat and nose at his alma mater; member of the American Laryngological, Rhinological and Otological Society; formerly on the staff of the Albany Hospital; aged 71; died, February 26, of myocarditis.

Hugh Forsythe Lorimer ✪ Englewood, Colo.; Columbus Medical College, 1883; in 1908 member of the House of Delegates of the American Medical Association; past president of the Ross County (Ohio) Medical Society; formerly member of the state board of health; aged 81; died, January 9, in the Presbyterian Hospital, Denver, of chronic myocarditis and paralysis agitans.

William Converse Kendall, Freeport, Maine; Georgetown University School of Medicine, Washington, D. C., 1896; for many years associated with the U. S. Bureau of Fisheries; was a member of the MacMillan Arctic Expedition; aged 77; died, January 28, in a hospital at Mobile, Ala., of intestinal obstruction and carcinoma of the rectum.

Brayton Eugene Kinne, Albany, N. Y.; New York Homeopathic Medical College and Hospital, New York, 1901; member of the Medical Society of the State of New York; fellow of the American College of Surgeons; visiting surgeon to the Memorial Hospital; aged 61; died, January 23, of arteriosclerosis, endarteritis obliterans and coronary disease.

George Quincy Johnson, Ardsley, N. Y.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1882; member of the Medical Society of the State of New York; medical officer of the public schools; aged 79; on the staff of the Dobbs Ferry (N. Y.) Hospital, where he died, January 23, of coronary thrombosis.

Maurice Louis Goodkind ✪ Chicago; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1889; professor of medicine at the University of Illinois College of Medicine; served during the World War; for many years on the staff of the Michael Reese Hospital; aged 71; died, January 4, of coronary occlusion.

Arthur Ernest Hale ✪ Alva, Okla.; University of Kansas School of Medicine, Kansas City, Kan., 1913; past president of the Woods County Medical Society; served during the World War; aged 52; on the staff of the Alva General Hospital, where he died, January 11, of gas bacillus infection, following operation for ruptured diverticulum.

Willis Harland Flamm, Amarillo, Texas; John A. Creighton Medical College, Omaha, 1908; member of the State Medical Association of Texas; past president of the Potter County Medical Society; on the staffs of the Northwest Texas Hospital and St. Anthony's Hospital; aged 56; died, January 8, of heart disease.

William Wallace Larsen, ✪ Le Mars, Iowa; State University of Iowa College of Medicine, Iowa City, 1913; member of the Iowa State Medical Society and the Radiological Society of North America; on the staff of the Sacred Heart Hospital; aged 55; died, January 19, of rhabdomyosarcoma with metastasis.

James Elmer Donnell, Cuba City, Wis.; Illinois Medical College, Chicago, 1907; member of the State Medical Society of Wisconsin; past president of the Grant County Medical Society; served during the World War; aged 62; died, January 19, in Dubuque, Iowa, of intestinal obstruction and carcinoma of colon.

John Frank Hastings ✪ Kenosha, Wis.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1906; past president and secretary of the Kenosha County Medical Society; on the staff of the Kenosha Hospital; aged 61; died suddenly, January 17, in Chicago, of chronic myocarditis.

Henry Wellington Cook, Hicksville, Ohio; Western Reserve University Medical Department, Cleveland, 1895; member of the Ohio State Medical Association; formerly member of the board of education of Hicksville and of the county board of education; aged 73; died, January 7, of bronchopneumonia.

Margaret Rodgers James, Allentown, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1929; member of the Medical Society of the State of Pennsylvania; on the staff of the Allentown Hospital; aged 35; was found dead, January 21, of injuries received in an automobile accident.

Joseph Edward Evans ✪ P.A.S., Lieutenant, U. S. Navy, Charleston, S. C.; Harvard University Medical School, Boston, 1927; fellow of the American College of Surgeons; entered the navy in 1927; served during the World War; aged 40; died, January 25, in the United States Naval Hospital.

Raymond Barzillia Burr, Blair, Neb.; University of Nebraska College of Medicine, Omaha, 1927; member of the Nebraska State Medical Association; served during the World War; aged 42; died, January 9, in the Immanuel Hospital, Omaha, of coronary occlusion and arteriosclerosis.

Augustus William Hendricks, Allentown, Pa.; Jefferson Medical College of Philadelphia, 1893; member of the Medical Society of the State of Pennsylvania; past president of the Lehigh County Medical Society; formerly city health officer; aged 70; died, January 31, of coronary embolism.

Clarence Paul Johnson, San Antonio, Texas; Baylor University College of Medicine, Dallas, 1929; member of the State Medical Association of Texas; on the staffs of the Nix and Robert B. Green Memorial hospitals; aged 38; died, January 14, when he fell from a twenty-one story window.

Marshall McDowell ✪ Cynthiana, Ky.; Medical College of Ohio, Cincinnati, 1894; treasurer of the Kentucky State Medical Association; past president of the Harrison County Medical Society; on the staff of the Harrison Memorial Hospital; aged 66; died, January 26, of cerebral hemorrhage.

George Hazard Crooker ✪ Providence, R. I.; Harvard University Medical School, Boston, 1893; veteran of the Spanish-American and World Wars; formerly on the staff of the Rhode Island Hospital; aged 73; died, January 12, of coronary thrombosis and bronchopneumonia.

John Alexander Jackson, New York; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1887; member of the Medical Society of the State of New York; aged 77; died, January 11, in St. Joseph's Hospital, Tampa, Fla., of cerebral hemorrhage.

George Stillman Clark, Worcester, Mass.; Harvard University Medical School, Boston, 1885; member of the Massachusetts Medical Society; aged 79; died, January 26, in the Memorial Hospital of arteriosclerotic gangrene followed by amputation of the left leg.

Francis Orman Hill, Monticello, Maine; Medical School of Maine, Portland, 1899; past president of the Aroostook County Medical Society; formerly member of the state legislature; aged 66; died, January 2, of coronary occlusion and cerebral hemorrhage.

William Henry Emery, Boston; Harvard University Medical School, Boston, 1870; member of the Massachusetts Medical Society; Civil War veteran; aged 90; died, January 21, in the Veterans Administration Facility, Bedford, Mass., of myocarditis and arteriosclerosis.

William T. Fitzgerald, Greenville, Ohio; Cleveland College of Physicians and Surgeons, Medical Department of the University of Wooster, 1891; formerly congressman; aged 79; died, January 12, of arteriosclerosis and streptococcic throat infection.

Guy Goodwin Fernald, West Concord, Mass.; Dartmouth Medical School, Hanover, N. H., 1899; member of the Massachusetts Medical Society; for many years on the staff of the Massachusetts Reformatory Hospital; aged 74; died, January 26.

Charles Whitefield Clark, Toronto, Ont., Canada; Hahnemann Medical College and Hospital, Chicago, 1866; Homeopathic Medical College of Missouri, St. Louis, 1867; aged 93; died, January 8, of carcinoma of the pancreas and duodenum.

Earle Wayne Cliffe, Youngstown, Ohio; Cleveland Homeopathic Medical College, 1909; member of the Ohio State Medical Association; served during the World War; aged 54; died, January 31, in St. Elizabeth's Hosptial of angina pectoris.

Charles Alexander Eastman, Detroit; Boston University School of Medicine, 1890; at one time inspector in the Indian Service of the U. S. Department of Interior; aged 80; died, January 8, of bronchopneumonia and chronic myocarditis.

John W. Cooper, Kempton, Ind.; Physio-Medical College of Indiana, Indianapolis, 1884; member of the Indiana State Medical Association; aged 80; died, January 23, in St. Francis Hospital, Beech Grove, of carcinoma of the stomach.

William E. Howell, Gallipolis, Ohio; Medical College of Ohio, Cincinnati, 1897; member of the Ohio State Medical Association; formerly county health officer; aged 70; was found dead in his automobile January 21, of heart disease.

Mark Jacob Gottlieb ⊕ New York; University and Bellevue Hospital Medical College, New York, 1909; on the staffs of the Beth Israel Hospital and the Hospital for Joint Diseases; aged 53; died, Dec. 21, 1938, of heart disease.

William Levi Ward, Victoria, Texas; University of Louisville (Ky.) Medical Department, 1880; aged 86; died, Dec. 27, 1938, in a local hospital of cerebral injuries received in an accidental fall down the stairway of his home.

George Benjamin Henke ⊕ Ontario, Calif.; Hahnemann Medical College of the Pacific, San Francisco, 1913; on the staff of the San Antonio Community Hospital, Upland; aged 54; died, January 25, of coronary occlusion.

Earl Berton Fitzpatrick ⊕ Martinez, Calif.; Oakland (Calif.) College of Medicine and Surgery, 1910; served during the World War; aged 51; died, Dec. 9, 1938, in the Community Hospital of tuberculosis of the bladder.

Frederick Leslie Dod, Kansas City, Mo.; University Medical College of Kansas City, Mo., 1904; member of the Missouri State Medical Association; served during the World War; aged 62; died, January 30, of pneumonia.

Arthur Wayland Howard, Wethersfield, Conn.; University of the City of New York Medical Department, 1890; member of the Connecticut State Medical Society; aged 71; died, January 16, of coronary thrombosis.

Theodore A. Erck, Leesburg, Fla.; University of Pennsylvania Department of Medicine, Philadelphia, 1892; fellow of the American College of Surgeons; aged 75; died, January 10, of carcinoma of the mesentery.

William F. Finney, Trenton, N. J.; University of Pennsylvania Department of Medicine, Philadelphia, 1874; aged 90; died, January 18, in St. Francis Hospital of prostatic hypertrophy and bronchopneumonia.

George W. Clayton, Laurel, Miss. (licensed in Mississippi in 1906); member of the Mississippi State Medical Association; on the staff of the Laurel General Hospital; aged 57; died, January 13, of angina pectoris.

Julius Arthur Dosher, Southport, N. C.; Baltimore Medical College, 1903; served during the World War; aged 59; on the staff of the Brunswick County Hospital, where he died, January 10, of pulmonary tuberculosis.

John Clifton, Vermillion, Kan. (licensed in Kansas in 1901); member of the Kansas Medical Society; formerly county health officer; aged 74; died, January 16, in Topeka of myocardial and renal insufficiency.

Rufus Peabody Hubbard, New York; Harvard University Medical School, Boston, 1883; aged 82; died, January 7, in St. Luke's Hospital of chronic glomerular nephritis and lobar pneumonia.

Clarence Denver Potter, San Francisco; Hahnemann Hospital Collge of San Francisco, 1896; member of the California Medical Association; aged 66; died, Dec. 8, 1938, of arteriosclerosis.

Horace Everett Doughty, Oxford, Maine; Baltimore Medical College, 1909; formerly member of the school board; aged 65; died, January 28, of nephritis and diabetes mellitus.

Jesse Willis Amey, Schenectady, N. Y.; University and Bellevue Hospital Medical College, New York, 1907; aged 67; died, January 11, in Miami, Fla., of cerebral hemorrhage.

Davis Leslie Askren, Fayoum, Cairo, Egypt; Central Medical College of St. Joseph, Mo., 1896; medical missionary; aged 65; died, January 18, of heart disease and emphysema.

Louis Philippe Dumont, Montreal, Que., Canada; Laval University Faculty of Medicine, Quebec, 1919; aged 43; was found dead, January 7, of poison, self administered.

Charles L. Baskin, Bremen, Ga.; Atlanta Medical College, 1895; member of the Medical Association of Georgia; aged 69; died, January 13, of uremia and paralysis agitans.

Patrick Joseph Brice, New Castle, Pa.; Jefferson Medical College of Philadelphia, 1907; aged 62; died, Dec. 17, 1938, in the New Castle Hospital of coronary occlusion.

Wilmer Kieffer Maglaughlin, Altoona, Pa.; University of Pennsylvania Department of Medicine, Philadelphia, 1890; aged 71; died, Dec. 23, 1938, of cerebral hemorrhage.

Anna Beauregard Searcy Bourne, Springfield, Mo.; University of Missouri School of Medicine, Columbia, 1900; aged 76; died, January 14, of coronary thrombosis.

Daniel Burleigh Parkhurst, Ogunquit, Maine; Hahnemann Medical College and Hospital of Philadelphia, 1900; aged 79; died, Dec. 29, 1938, in Boston of myocarditis.

Joseph Leal d'Azevedo, Oakland, Calif.; College of Physicians and Surgeons, San Francisco, 1901; aged 63; died, Dec. 18, 1938, of arteriosclerotic heart disease.

John Aloysius Barry, Boston; Georgetown University School of Medicine, Washington, D. C., 1891; aged 77; died, Dec. 9, 1938, of carcinoma of the intestine.

George Howard White ⊕ Baltimore; Johns Hopkins University School of Medicine, Baltimore, 1906; aged 57; died, Dec. 21, 1938, of carcinoma of the colon.

Charles Cochran Kemble ⊕ Erie, Pa.; Jefferson Medical College of Philadelphia, 1897; aged 62; died, Dec. 24, 1938, in St. Vincent's Hospital of liver abscess.

Oliver R. Fore, Canton, Miss.; Atlanta College of Physicians and Surgeons, 1902; served during the World War; aged 63; died, Dec. 23, 1938, of gastric ulcer.

Cassius M. Clay, Milton, Fla.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1897; aged 83; died, Dec. 26, 1938, of endocarditis.

Aslak Milo Boe, Northfield, Minn.; University of Minnesota Medical School, Minneapolis, 1926; aged 40; died, January 8, of pulmonary tuberculosis.

Elizabeth Fear Leffingwell, Aurora, N. Y.; University of Buffalo School of Medicine, 1888; aged 76; died, Dec. 21, 1938, of carcinoma of the intestine.

Dilly Nelson Pattison, Oelwein, Iowa; State University of Iowa College of Medicine, Iowa City, 1897; aged 62; died, Dec. 26, 1938, of coronary sclerosis.

B. Cornelison, Louisville, Ky.; Keokuk (Iowa) Medical College, 1891; aged 87; died, Dec. 29, 1938, at the Norton Infirmary of cerebral hemorrhage.

Howard Nelson Nason, Mill River, Mass.; College of Physicians and Surgeons, Boston, 1909; aged 61; died, Dec. 12, 1938, of carcinoma of the prostate.

Philip T. Leighly, Hebron, Ind.; Kentucky School of Medicine, Louisville, 1888; aged 78; died, Dec. 31, 1938, of nephritis and chronic prostatitis.

Allen Bonebrake, Goldendale, Wash.; Willamette University Medical Department, Portland, Ore., 1883; aged 86; died, Dec. 31, 1938, of cerebral anemia.

Edwin Carman, Freeport, N. Y.; Long Island College Hospital, Brooklyn, 1889; aged 71; died, January 8, of chronic glomerular nephritis and uremia.

William Waldron Ware, Stanton, Tenn.; Vanderbilt University School of Medicine, Nashville, 1899; aged 65; died, Dec. 8, 1938, of arteriosclerosis.

William Allenson Greer, Fountain City, Tenn.; Vanderbilt University School of Medicine, Nashville, 1897; aged 67; died, Dec. 19, 1938, in Sebring, Fla.

Charles A. Monroe, Oakland, Calif.; Cleveland Medical College, 1895; aged 68; died, Dec. 13, 1938, of chronic myocarditis and pulmonary edema.

Charles William Haentschel, Haileybury, Ont., Canada; McGill University Faculty of Medicine, Montreal, Que., 1888; aged 78; died, Dec. 15, 1938.

Charles P. Hemphill, Sweatman, Miss.; Louisville (Ky.) Medical College, 1884; aged 81; died, January 28, of pneumonia.

Orlo L. Mapes, Lakeside, Ohio; American Eclectic Medical College, Cincinnati, 1886; aged 79; died, Dec. 23, 1938.

John W. Roark, Roanoke, Texas (licensed in Texas, under the Act of 1907); aged 66; died, Dec. 17, 1938.

S. D. Caver, Linnflat, Texas (licensed in Texas, under the Act of 1907); died in December 1938.

Correspondence

"RELATION OF PHYSICAL EXERTION AND EMOTION TO PRECIPITATION OF CORONARY THROMBI"

To the Editor:—In an article entitled "Relation of Physical Exertion and Emotion to Precipitation of Coronary Thrombi" in THE JOURNAL, March 11, Dr. J. C. Paterson categorically stated that coronary thrombi are precipitated by exertion and emotion. This is contrary to our observations previously published in THE JOURNAL and elsewhere.

In the summary the author states that "activities of a patient immediately preceding the onset of an attack of coronary thrombosis have no relation to the etiology of the precipitation of a thrombus but are purely coincidental." Yet the very next sentence is "The pathologic appearances in a series of fatal cases of coronary thrombosis suggest strongly that exercise and emotional stress are intimately concerned in the mechanism of coronary artery thrombosis." These statements are contradictory.

If the author means unusual activities a few hours to a few days prior to the closure rather than the activities immediately preceding it, we have his statement with regard to his two cases that "both persons were pursuing their ordinary activities until just before their fatal attacks, and patient 2 was known to have been without complaints and in good spirits three and one-half hours before his death." Hence the author cannot believe that effort immediately or sometimes before the occlusion was a factor.

Although the author states that "on purely pathologic grounds there is reason to believe that such physical and mental states, both of which result in temporary hypertension, cannot be excluded as precipitating factors of coronary thrombi," he actually gives purely theoretical arguments but neither pathologic nor clinical evidence. Our belief that coronary artery occlusion is not related to activity or emotional stress was based on carefully elicited histories in 800 ward and private cases and not on theoretical discussion of blood pressure.

The author assumes that subintimal hemorrhage, with which it is now agreed coronary occlusion is usually associated, is produced by exertion or emotion resulting in an increase in blood pressure in the subintimal capillaries. There is no proof for this assumption. Leary and other investigators have shown, and Paterson himself has corroborated, that subintimal hemorrhages are part of the progressive arteriosclerotic process in the coronary arteries; it is unnecessary to invoke a rise in blood pressure to explain them. As a matter of fact, Winternitz found it necessary to perfuse the coronary arteries at pressures of from 500 to 1,000 mm. of mercury in order to outline the subintimal capillaries. In spite of these enormous pressures, far beyond any figure attained in hypertension, rupture of the capillaries did not occur, although severe coronary sclerosis was present. Furthermore, we have now collected a group of forty patients who because of the presence of carcinoma, heart failure and the like had been in bed for weeks or months prior to the attack of coronary artery occlusion. In spite of the absence of effort in such persons, subintimal hemorrhage was just as common as in others going about.

Paterson's two cases indicate that in some instances a varying period may elapse between the onset of thrombus formation and the clinical attack. This is not a new idea at all, having been noted by a number of writers including Levy and Bruenn in THE JOURNAL in 1936. We realized therefore that it was necessary to know the activity of the patient for some time prior to the acute episode, and in the last 250 cases we have analyzed the activities of the patient during the entire four weeks prior to the attack. These data have confirmed our belief that activity plays no role in precipitating coronary thrombosis. Not only did the attack begin at rest, as a rule, but there was no history of undue exertion or emotion previously. The occurrence of coronary artery occlusion in the forty patients who had been bedridden for weeks and months is confirmatory evidence of this.

It seems reasonable to us to collect clinical facts and to correlate them with the pathologic observations or with some tested physiologic mechanism. Paterson has completely ignored the clinical facts. These can be obtained by any one who takes a detailed history of the events preceding an attack of coronary artery occlusion. He will be struck by the fact that classic coronary artery occlusion almost invariably occurs in the absence of effort, excitement and trauma. In 1,400 cases we found the activities associated with coronary artery occlusion as follows:

Sleep	22.3	53.4%
Rest	31.1	
Mild activity	20.2	44.5%
Moderate activity	8.5	
Walking	15.8	
Unusual exertion	2.0	2.0%

This trifling association of coronary artery occlusion with unusual exertion eliminates it as a factor in the precipitation of the attack; otherwise coronary artery occlusion should occur very much more frequently for all of us, including those with coronary artery sclerosis who exert themselves during the day. If effort or excitement were a factor in the onset of coronary occlusion, sufferers from coronary sclerosis would never dare to move, read a newspaper or listen to the radio.

Since coronary artery occlusion occurs usually at rest or during sleep, it is even possible to explain subintimal hemorrhage on the basis of a drop in blood pressure and not on a rise, as Paterson assumes. It has long been known that, in shock with a fall of blood pressure, capillary hemorrhages are present throughout the body. In patients with severe coronary sclerosis, bleeding from an ulcer, for example, may produce coronary insufficiency and death. There is a fall of blood pressure concomitant with the exsanguination and yet fresh subintimal hemorrhages may be found post mortem.

We found not only that physical activity or emotional stress was not a factor in the onset of coronary artery occlusion but that occupation also played no role, attacks being equally common in laborers and persons engaged in sedentary occupations. This further corroborates our belief.

ARTHUR M. MASTER, M.D. HARRY L. JAFFE, M.D.
SIMON DACK, M.D. New York.

TUMORS IN TWINS

To the Editor:—I am making an analysis of records of tumors in twins and would be glad if you could lend me assistance by publishing this appeal for information to the medical profession of America:

A number of records have been published of tumors occurring in one or both members of a pair of twins. There is a divergence of opinion as to the conclusions that can be drawn from such reports. I am therefore asking all members of the profession who have had occasion to diagnose or treat tumors, either benign or malignant, in either one or both members of a pair of twins to communicate with me, giving the following information as far as possible:

Twin 1. Name Sex Tumor? Site Type
Age of onset Age at death Age, if still living
Was there operative or pathologic confirmation of the diagnosis?
Twin 2. Same information.

If the twins were of the same sex, were they so similar in appearance as to cause confusion in identity or were they dissimilar?

Those cases in which only one twin was affected are just as important as those in which both twins have the tumor. The names are important but will be kept confidential, because if the same person was treated by several physicians, all of whom were to send in information, the name would aid in checking the fact that there was a duplication. The age at the time tumor arose and the age at death or at which the twins are still living is of great importance also. If the tumor began in twin 1 six months ago and twin 2 has not yet shown it, the short duration of time must be considered in evaluating the record; but if the second twin has lived twenty years without the tumor developing, that point should be noted. Because there are not many available records of tumors in twins, I appeal to all members of the profession who read this note to send to me as soon as possible any data which they have on tumors in twins.

MADGE THURLOW MACKLIN, M.D., LL.D.,
London, Ont.
Assistant Professor of Histology and Embryology,
Medical School, University of Western Ontario.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILB BE OMITTED ON REQUEST.

VITAMINS IN GREEN AND RIPENED FRUITS

To the Editor:—What difference is there in the vitamin potency of tree-ripened fruit and fruit picked green and allowed to ripen?

LEONARD T. CARLSON, M.D., Minneapolis.

ANSWER.—This question cannot be answered categorically because there is a paucity of information on the subject and other important considerations are implied by the question. Most of the studies relating to ripening of fruits and the vitamin content have been made on tomatoes and oranges, and some of them have been confined to vitamin C. It has been reported that fully matured but green tomatoes are lower in vitamin A and vitamin C than vine-ripened fruit and that green fruit when ripened in the air shows some increase in vitamins A and C but does not acquire the same vitamin content as tomatoes ripened on the vine. There appear to be no important changes in the vitamin B content during the process of ripening, irrespective of method.

Two rather extensive studies on oranges show that if the fruit is picked in the early stages of maturity (state laws require that a certain acid-sugar ratio must be reached in the juice before interstate shipment is permitted) the vitamin C content of the juice is fully equal to that reached at any later stage of maturity.

Treatment with ethylene gas or the gas from oil heaters is extensively used to change the color of immature fruit to that of naturally ripened fruit. It appears that the only important change produced by this treatment is a bleaching of the chlorophyll so that the color of naturally ripened fruit is produced. This process does not alter the vitamin content of the fruit.

The generalization may be made that fruit shows a lowering of vitamin C during storage, but there are no important changes with respect to the other vitamins. It is improbable, however, that the metabolic changes during storage proceed to an important degree during the period required for ripening after the fruit has been picked. It is not possible to state with assurance that from a practical standpoint there is a measurable advantage in consuming fully tree-ripened fruit as compared with fruit picked at such a stage of maturity that it can be ripened off the tree.

The vitamin C content of fruits is discussed in the paper "Vitamin C Methods of Assay and Dietary Sources" by Otto A. Bessey, THE JOURNAL, Oct. 1, 1938, page 1290.

SALT SUBSTITUTES AND NEPHRITIS

To the Editor:—Is it the sodium or chloride ion that is advised against in the treatment of renal conditions associated with edema? I thought it was the sodium ion that was the detrimental factor. If the sodium factor, then would not that be contraindicated in the use of commercial "Curtasal"-Winthrop? This is advised for use to flavor foods when the use of salt is not advised. It contains, they say, "sodium formate with the addition of a small amount of magnesium citrate and calcium formate." What might one use advantageously to flavor foods when regular salt is not advised?

M.D., Wisconsin.

ANSWER.—The early work on the relation between salt retention and edema laid undue emphasis on the chloride ion, largely because of the difficulty of analyzing for sodium. When it was later demonstrated that potassium chloride, calcium chloride and ammonium chloride actually produced diuresis in edematous patients, emphasis was shifted to the cation sodium. Further work on clinical and experimental states of dehydration and hydration, or edema, revealed a quantitative relation between sodium and water excretion or retention, respectively. However, the conclusion that the chloride ion is unimportant in edema in comparison with the sodium ion is not justified. It is much easier, other things being equal, to produce edema with sodium chloride than with the equivalent amount of sodium bicarbonate. This follows from the normal composition of body fluids, in which there is about four times as much chloride ion as bicarbonate ion. The antiedemic effect of other chlorides than sodium chloride is undoubtedly due as much to the inability of the body to retain sodium without chloride as to the inability to retain chloride without sodium. Therefore, both sodium and chloride should be restricted in the treatment of edema.

Commercial substitutes for salt usually contain sodium and calcium compounds of formic, malic or amino acids. These are partly excreted unchanged but largely converted into bicarbonates. Since sodium bicarbonate is less edema producing than sodium chloride, the moderate use of these salt substitutes may not harm the patient in spite of the theoretical objection to sodium intake.

Any salt-free condiment or flavoring agent may be allowed to an edematous individual. Pepper, vinegar, lemon juice, onion, paprika and cinnamon can be suggested. D-glutamic acid, which is converted to urea in the body, has been recommended in doses of from 5 to 10 Gm. a day. The sodium salt contains only one third as much sodium as sodium chloride, per gram, and is seven times as salty. This salt has been used extensively in Chinese cooking. Both d-glutamic acid and its sodium salt are available commercially in pure form.

According to information received from the Winthrop Chemical Company by the Council on Pharmacy and Chemistry, Curtasal is composed of sodium formate 98 per cent, magnesium citrate 1 per cent and calcium formate 1 per cent. This preparation has not been submitted to the Council or examined by the Chemical Laboratory.

References:

Salt Substitutes in the Diet, THE JOURNAL, Aug. 6, 132, p. 497.
Hosal and Bromhosal Not Acceptable for N. N. R., THE JOURNAL, July 22, 1933, p. 280.
Eka Salt Not Acceptable for N. N. R., Annual Reprint of the Reports of the Council on Pharmacy and Chemistry for 1934, pages 46, 47 and 48.

ANTIGEN-ANTIBODY REACTIONS—DENATURED PROTEINS

To the Editor:—1. Has any successful concentration of antibodies been obtained by attempted separation of antibody from antigen? 2. Can a denatured protein be restored to its native state? I have a recollection that Anson and Mirsky made some attempts along this line.

ALBERT ZRUNEK, M.D., Chicago.

ANSWER.—1. This question can be considered from two points of view: first, whether the reaction between antigen and antibody is a chemically reversible reaction in the sense that in a mixture of the two substances an equilibrium is attained in which the speed of combination is equal to the speed of dissociation, and, second, whether the isolated product of the reaction of antibody and antigen, in the form of either sensitized bacteria or cells, or precipitate from precipitin reaction, can be separated by manipulation into its component parts.

Reversibility in antigen-antibody reactions has been the subject of much experimentation and is discussed in such publications as "Infection and Resistance" by Hans Zinsser and "The Chemistry of Antigens and Antibodies" by Marrack. Madsen, Arrhenius and Ehrlich proposed that the basic laws of chemical equilibrium and mass action applicable to the reaction of acids and bases can find their analogies in serologic reactions. On the other hand there are facts that are inconsistent with these theories, such as the Danyz phenomenon, in which there is a

different result when the same quantity of antigen is mixed with a given quantity of antibody and when it is mixed in divided amounts, and the observation that the precipitate from precipitin reactions does not always dissolve in excess of antigen as would be expected in true equilibriums. The fact does remain, however, that the combination of antigen and antibody is in some instances clearly reversible, as shown by the following experiment: If an amount of red cells is saturated with hemolytic amboceptor, washed free of excess of this reagent and then mixed with an amount of untreated red cells, all the red cells, both the original and the newly added ones, can be shown to be sensitized by the hemolysis following the addition of complement. The only explanation of this phenomenon is that red cells may combine with more amboceptor than is necessary for hemolysis but will give up the excess amboceptor in the presence of unsensitized red cells.

The combination of antigen and antibody may be destroyed by various manipulations. The efficacy of neutral mixtures of diphtheria toxin and antitoxin as immunizing agents indicates that in the body the toxin is slowly released from its combination with antitoxin. The readiness with which this combination can be broken up is illustrated also by the incident which occurred a few years ago when a commercial product of diphtheria toxin-antitoxin became highly toxic after it had been frozen. The precipitate from precipitin reactions and cells and bacteria sensitized with their corresponding immune serums can be treated with various reagents so as to release the bound antibody. Hypertonic or relatively strong alkaline solutions are usually employed and use is made of the method to obtain highly purified antibody solutions. Heidelberger and Kendall (*J. Exper. Med.* **64**:161 [Aug.] 1936) in this way obtained from the precipitate formed with pneumococcus polysaccharide and antipneumococcus serum a solution of antibody in which 93 per cent of the nitrogen belonged to the immune bodies.

2. Denaturation of proteins, in contradistinction to precipitation, carries with it the idea of permanence. The actual chemical changes that occur in the process of denaturation are consistent with this idea. While there are some writers who say that denaturation is a reversible process, they base their assertion solely on the fact that some, but by no means all, denatured proteins can be redissolved. But there have been few attempts to show that the properties of the redissolved protein are identical with the native protein. The best evidence on this point is obtained by immunologic means. Theoretically, denatured proteins should be antigenic because they are digestible, since digestibility and antigenicity are closely parallel. However, the insolubility of denatured proteins interferes with their antigenic properties. When resolution of denatured proteins can be accomplished without secondary alterations due to the solvent, or when denaturation can be produced without coagulation, the proteins can be used as antigens. In such instances the immune reactions have shown that in most cases denaturation results in marked changes in specificity and this, in turn, denotes changes in the chemical structure of the proteins. From this evidence it is probable that recovery of native properties of proteins after denaturation does not occur.

CEREBRAL TRAUMA AND DUODENAL ULCER

To the Editor:—I understand that a gastric or duodenal ulcer can be a sequel to a severe head injury. Please enlighten me on this subject and give references. M.D., Manitoba.

ANSWER.—The relation between intracranial lesions and gastrointestinal ulcerative processes, according to Cushing's review of the subject (Peptic Ulcer and the Interbrain, *Surg., Gynec. & Obst.* **55**:1 [July] 1932), was first suggested by Carl Rokitansky as early as 1841. Within the last decade there have been several reports of brain tumors, operations and accidents with gastrointestinal ulcerative processes, and experimental evidence of this possible relationship has been produced.

Cushing reported three cases of acute perforating gastrointestinal lesions which followed operations for cerebellar tumors. He also cited two cases of gastric erosions following operations for brain tumor, two cases of gastric ulcer associated with malignant hypertension with choked disks, the case of a child of 10 with chronic cicatrizing duodenal ulcer associated with a recurring cerebellar tumor, and the case of a man with duodenal ulcer who had a recurrence of gastric distress associated with each of three exacerbations of intracranial symptoms from a radiosensitive tumor encroaching on the third ventricle.

Vanzant and Brown (*Am. J. Digest. Dis.* **5**:113 [April] 1938) described the case of a well nourished, healthy boy of 11 who was hit by a truck, taken to the hospital, treated for concussion for four days, and returned to school in another ten days. Twenty days after the accident his appetite failed and on eating he noticed pain in the epigastrium. Six weeks after the injury a diagnosis was made of contusion and laceration without localizing signs. There was a spinal fluid pressure of 180 mm. of water, and blood in the stools. Fluoroscopic examination showed a small, irritable, constantly deformed duodenal bulb. A diagnosis of duodenal ulcer was made and the symptoms disappeared on ulcer management.

Additional references:

Masten, M. G., and Bunts, R. C.: Neurogenic Erosions and Perforations of the Stomach and Esophagus in Cerebral Lesions, *Arch. Int. Med.* **54**: 916 (Dec.) 1934.

Opper, Lincoln, and Zimmerman, H. M.: Ulcers of the Digestive Tract in Association with Cerebral Lesions, *Yale J. Biol. & Med.* **11**: 49 (Oct.) 1938.

SPASTIC QUADRIPLEGIA—TOXIC NEURITIS

To the Editor:—1. A white woman aged 50, seen two weeks ago, first noticed difficulty in talking about one year previously. This has gradually increased until now her speech is indistinct. Then she noticed a stiffness of her arms and later of her legs. The paralysis of the legs has progressed so that now she cannot walk and can only with great difficulty move the arms or legs at all. Mentally she seems alert and active but cannot use the muscles of speech to express herself. The blood pressure is 134 systolic, 90 diastolic; the pulse rate is 96. Physical examination shows spastic quadriplegia. She sits with her arms flexed and hands closed. As she sits, her legs tend to straighten out stiffly. The feet are inverted by muscular pull. The extremities show lead pipe rigidity, with greater resistance to flexion than to extension. The left side is more involved than the right. The Babinski reflex is present on the left side; no tremor is present; the fingers can be straightened passively but resist straightening. The Wassermann reaction is negative. The pupils are equal and react well to light. What is the most probable diagnosis? Could a brain tumor cause this? What line of treatment would be advisable? 2. A man about 50 years old has recently returned from Florida. While there he worked removing "bootjacks" from the trunks of some palmetto trees. Shortly after he developed a tingling and pain in both hands and arms. Following this he developed muscular weakness of both forearms and hands. The patient feels sure that this resulted from a poison in the muck under the bootjacks. Have cases of a toxic neuritis ever been reported caused by this? He worked a total of only fifteen or twenty hours. What is the probable duration of this condition and the best line of therapy? M.D., Washington.

ANSWER.—1. The gradually increasing spastic quadriplegia in a patient 50 years of age without signs of arterial disease, over a period of two years, is suggestive of one of the degenerative diseases of the nervous system. The diagnosis is probably paralysis agitans without tremor. This would account for the speech defect as well as for the spastic paralysis of all four extremities. It would not, however, quite satisfy the finding of "lead pipe" rigidity or the presence of the Babinski reflex on the left side. The rigidity of paralysis agitans is not of the lead pipe type but gives rise, when passive motion is used, to the cog-wheel type of stiffness. The so-called lead pipe type is ordinarily confined to diseases of the pyramidal tract, paralysis agitans being one in which the extrapyramidal tracts are involved, including the motor cells in the basal ganglions of the brain and possibly elsewhere. The Babinski sign, moreover, is indicative of pyramidal tract disease and would not be found in the ordinary case of paralysis agitans. If these two signs are substantiated by repeated examination, another cause for the patient's symptoms should be sought.

The slow onset and progressive character of the disease are against thrombosis or hemorrhage as the etiologic agent, although either of these, if present in the upper cervical spinal cord or lower end of the medulla oblongata, might give rise to symptoms such as the patient presents. Tumor in this region should also be considered. The fact that there is no disturbance of sensation, however, militates against this diagnosis. In spite of the patient's age there is no reason to forego the amount of information obtainable from examination of the spinal fluid. Pressure studies and estimation of the protein content of the fluid might lead to a more positive diagnosis. If there is a hydrodynamic block in the spinal fluid, or if the protein is markedly elevated, tumor is likely and competent neurologic or neurosurgical advice should be sought.

2. So far as can be ascertained, there is no poisonous substance in the "bootjacks" from palmetto trees or in the muck which lies under them. Toxic neuritis, therefore, from these substances has not been reported. It is more likely that the patient suffers from one of the more ordinary types of infectious neuritis and that he should be treated along the usual lines for this disease. Such treatment consists in massage and galvanism to the muscles affected, if these muscles do not respond to the faradic current, and prevention of overstretching by the use of splints, if necessary. If there are obvious foci of infection elsewhere in the body, these should be removed. Antineuritic vitamin B might be added to the diet if the neuritis is at all extensive.

HYPOSPADIAS IN ADULT

To the Editor:—Please give me information on operations for hypospadias in adults. A man aged 30 has had some childhood diseases, an attack of influenza in 1919 and two attacks of gonorrhea. His physical examination is essentially negative except for a slight secondary anemia (color index 0.9) and a penile hypospadias. The urinary meatus is approximately 1½ inches back from the end of the penis. There is a definite chordee and a rudimentary urethral groove with a rudimentary corpus cavernosum reaching nearly to the end of the penis. There is a large dorsal prepuce in the shape of an apron. My plan of operation is to straighten out the penis by a transverse ventral incision with subsequent severing of the rudimentary cavernosum and suturing in the opposite direction. In the second step for building up the urethra proper I want to use the Ombrédanne method, utilizing the prepuce. I wish to know your opinion as to this plan and I would like to know further whether the use of a permanent catheter during the first or second stage of the operation, or during both stages, is indicated. Is it advisable to destroy the hair follicles in case some hair-bearing part of skin is used for building up the new urethra? There are plenty of references to be found as to the correction of this malformation in early childhood, but so far I have been unable to find anything dealing with the situation in adults.

M.D., California.

ANSWER.—Whether or not a man who is 30 years of age should have an operation for the correction of hypospadias may be open to debate. This depends on whether the patient is married; if he is, and can perform his marital duties, it might be well at 30 to "let well enough alone." On the other hand, if the patient is not married and wishes his defect corrected before he gets married, one might discuss the question of an operation for the hypospadias.

If the presence of the chordee prevents the patient from having satisfactory intercourse, one is justified in advising him to have the curvature straightened. As suggested, this may be done by making a transverse ventral incision. On the other hand, a good many men are now using the tube graft instead of the procedure suggested in the query. If the patient is married and his wife has borne children, it may be possible that correcting the deformity alone is all that may be needed. But if it is a question of sterility and if the external urethral orifice is far back, the urethra of course would have to be advanced in order to deposit the semen in the vagina. Then again, if the opening is only an inch or so behind the tip of the glans penis it might be well to leave it alone.

The objection to the use of the Ombrédanne method is the fact that hair may be present and stone formation may occur; therefore many men believe in the advisability of destroying the hair follicles.

Various types of operations are discussed and illustrated in textbooks on urology.

PERFORATION AND BLEEDING IN PEPTIC ULCER

To the Editor:—I would appreciate it if you would give me some information regarding an accident case under my care. 1. I should like to know the percentage of occurrence of perforation in ulcer ventriculi et duodeni according to the latest statistics. 2. What is the percentage of occurrence of bleeding in cases of ulcer of the stomach and duodenum? 3. What is the percentage of occurrence of the two in the same ulcer patient? 4. From what literature could I learn most about occurrence of bleeding in ulcer cases after trauma (heavy lifting and strenuous work)?

M.D., Massachusetts.

ANSWER.—A critical review of the recent literature on the incidence of perforation and bleeding in chronic gastric and duodenal ulcer reveals a variable array of statistics. This is particularly true with reference to bleeding. Statistics based on the cases admitted to the large metropolitan charity hospital or outpatient clinic differ materially from those published by the private hospital or private practitioner. There also is marked variation in the immediate mortality from bleeding ulcer following medical or surgical treatment. The incidence of acute and chronic perforation and hemorrhage is also influenced by the element of time; that is, the duration of the disease when the patient first came under observation and the duration of the period of observation thereafter. Therefore the data submitted are approximate, strictly speaking, rather than exact.

1. Acute perforation occurs in 5 per cent of ulcers of the stomach and duodenum. Statistics embracing a large series of surgically verified cases reveal that subacute (forme fruste) and chronic perforation occurs in from 25 to 28 per cent of both gastric and duodenal ulcers. The large majority of these (over 90 per cent) are of the chronic variety.

2. The percentage of occurrence of bleeding in both gastric and duodenal ulcer is 30.

3. The occurrence of both acute perforation and hemorrhage is infrequent. Available statistics are too meager on which to base any definite conclusions. Goldman (*Ann. Surg.* **40:** 541 [June] 1938) reported seven cases of this nature representing 2 per cent of the entire series reported. The impression that bleeding ulcers do not perforate and perforating ulcers do not bleed is justifiable to a considerable extent. However, as high as 8 per cent of duodenal ulcers which had given rise to hemorrhage of variable extent showed evidence of chronic perforation at operation.

4. The following textbooks and articles may be consulted:

Brahdy, Leopold, and Kahn, Samuel: Trauma and Disease, Philadelphia, Lea & Febiger, 1937, p. 181.

Eusterman, G. B., and Balfour, D. C.: The Stomach and Duodenum, Philadelphia and London, W. B. Saunders Company, 1936, p. 756.

Crohn, B. B.: Affections of the Stomach, Philadelphia, W. B. Saunders Company, 1927, p. 621.

Beams, A. J.: Industrial Aspects, *Ohio State M. J.* **32:** 130 (Feb.) 1936.

Alvarez, W. C.: Severe Gastric Hemorrhage Produced by Violent Abdominal Massage, THE JOURNAL, July 11, 1936, p. 129.

On the basis of repeated observation by competent authorities with large experience, the evidence seems indisputable that unusual physical or mental exertion as well as alcoholic debauches and external trauma can provoke gross hemorrhage in a patient harboring an acute or chronic peptic ulcer.

POSTOPERATIVE DEATH FROM ANURIA

To the Editor:—In a case of anuria following an operation for gangrenous appendicitis, death resulted forty-three hours after operation without indications of peritonitis, and with the patient in what seemed to be a good condition when he left the operating room. The patient, aged 37, weighed 175 pounds (79 Kg.), was the father of three healthy children and enjoyed good health until the operation except for two previous spells of abdominal pain that were suggestive of appendicitis, the first in 1936 and the second in July 1938. He was seen forty-eight hours after the first symptoms, November 9. Operation began at 7:05 p. m. and terminated at 8:50. A much thickened gangrenous appendix was removed and rubber drains were inserted down to the stump. He left the operating room with a pulse rate of 100, respirations 30, blood pressure 164 systolic, 64 diastolic. Before operation he had a red blood cell count of 5,180,000 with hemoglobin 100 per cent, white cell count 13,800, polymorphonuclears 86 per cent and with a urine specific gravity of 1.020 and negative for albumin, sugar, acetone, indican, red or white cells, casts, crystals or amorphous sediment. The Wassermann reaction was negative. After operation his condition seemed good. He had a morphine injection of one-fourth grain (0.16 Gm.) at midnight and 4 a. m., with 2,000 cc. of 10 per cent dextrose in saline solution given during the night. He voided 10 ounces (300 cc.) of urine at 6 a. m., at which time the pulse was 98, respirations 22 and temperature 101. During the day of November 10 hypodermoclysis of 3,000 cc. of 10 per cent dextrose solution was given. The abdomen remained soft but the temperature went up to 103 F. and no urine was voided until death occurred at 3 a. m. November 11. The catheter was passed three times during this period but no urine was found in the bladder. The patient died in coma. Stimulants, oxygen and general symptomatic treatment were given. Did this anuria result from operative shock, the anesthetic (nitrous oxide and ether), by reflex action on a normal kidney or were we dealing with a previously damaged kidney that was functioning well? Was forty-three hours sufficient time for a fatal uremia in a previously normal person?

C. E. JUMPER, M.D., El Paso, Texas.

ANSWER.—In this case there was probably a previously damaged kidney. The damage had not been sufficient, however, to cause symptoms or produce albumin in the urine. Nonprotein nitrogen and urea estimation before the operation would have been of value and interest but certainly was not indicated in the emergency that existed. It would seem unlikely that nitrous oxide and ether or operative shock could have been an important factor in this case. An intravenous injection of 50 per cent dextrose solution might have been of some value, although it is doubtful.

CRYSTALLIZED BLOOD FOR DIAGNOSIS

To the Editor:—I am writing with regard to the article published in *Life* magazine January 2 on "Diseases Diagnosed by Crystallized Blood." I am much interested in this article and should like to know where I can obtain more detailed information concerning the subject.

PAUL G. WEISMAN, M.D., Colfax, Wash.

ANSWER.—The article in question was probably based on a report by Dr. P. Bégouin of Bordeaux at the June 28, 1938, meeting of the Académie de médecine of Paris. According to this report, blood for the test is obtained by needle puncture of the fingers and is received in distilled water to which a solution of chloride of copper is added. Crystallization takes place in the specimen in eighteen hours. The results were as follows: In cancer a correct diagnosis was made in thirty of seventy-nine cases of various types and in tuberculosis a correct diagnosis in eight of nine cases; in one patient who had syphilis and a cancer of the tongue, the former was diagnosed but not the latter; crystallization permitted a differential diagnosis to be made between a cancer of the epithelial type and other tumors such as sarcoma and those of a mixed cell type. It has been maintained by Pfeiffer, a Swiss chemist, who is the originator

of the test, that this method is also helpful in determination of the correct drug to be employed. It seems to be agreed that long training is required before one can attempt this method. The only one who has apparently tried the method so far is the French surgeon Dr. Bégouin and so far as can be determined he has not made any further observations since early in 1938. It is at least obvious from the foregoing that this method is highly experimental, that it will require much independent confirmatory evidence before it can be accepted and that it should under no circumstances replace the more established and definitely known reliable methods of diagnosis and treatment already available. This is another example of premature (to say the least) publicity in a nonmedical publication.

GOLD INJECTIONS AND COLITIS

To the Editor:—A young woman has been having gold injections for lupus erythematosus. During the process of treatment some tenesmus with frequency of bowel movements developed. At this time a maculopapular rash was noted on the chest and abdomen. The diarrhea insidiously progressed within the next two weeks into a fulminant colitis. Rectal discharges became frequent, bloody and purulent. On repeated cultures of the stools the predominant organism was identified as the diplostreptococcus described by Bargen. The heavy metals are notably eliminated in the intestinal tract. In overdoses (or susceptibility?) thrombosis of the small blood vessels of the intestinal mucosa occurs. Bargen has described the histologic appearance of ulcerative colitis as essentially a process of minute and discrete ulceration attendant on septic infarction of the blood vessels of the mucosa and submucosa of the colon. Whether Bargen is right in his contention that this organism is the causative agent of ulcerative colitis or whether, as Paulson has pointed out, this is one of a group of cocci whose normal habitat is in the ileum and which have been washed down into the colon is beside the point in this instance. Is it plausible to feel in this case that the resistance of the intestinal wall may have been lowered as a result of damage to the endothelium of the blood vessels in the excretion of the injected gold so that usually innocuous bacterial inhabitants have become facultative pathogens? Or is it safe to dismiss the sequence of heavy metal administration and diarrhea as purely coincidental and unrelated?

M.D., Connecticut.

ANSWER.—No references have been found in the literature to reactions from gold injections in which there was a complicating involvement of the mucous membrane of the colon. The patient did have a maculopapular eruption, however, over the chest and abdomen, and it would certainly be wise to discontinue further gold injections. It might be well to use bismuth injections instead. Before instituting that form of treatment, however, the blood should be examined carefully. With all of the heavy metals, it is well known that occasionally aplastic anemia and even agranulocytosis occurs. Is there a possibility of such a contingency in this case? If there is, one could understand the reaction in the colon, as there is no reason why such a reaction could not occur there just as well as in the pharyngeal space, for example.

HORSE DANDER AND HORSEHAIR IN ALLERGY

To the Editor:—I should like to call your attention to an apparent discrepancy between an answer under the subject "Asthma" in THE JOURNAL Nov. 12, 1938, and that under the subject "Allergy to Horsehair" in THE JOURNAL March 12, 1938. In the later answer it is stated that "even patients sensitive to horse dander are not sensitive to horsehair after its preparation for use in furniture." The answer on March 12 says that "therefore horsehair mattresses can cause symptoms in all but the least sensitive individuals." Does this difference exist between those who have asthma and those who have a vasomotor rhinitis or do the two answers represent individual opinions?

GORDON B. SMITH, M.D., Rutland, Vt.

ANSWER.—The inquiry resolves itself into a question of whether an individual who is sensitive to horse dander usually has a sensitivity to horsehair as found in mattresses and furniture or whether such an individual is never sensitive to horsehair. Several years ago, with the idea of attempting to solve this question, some experiments were made on horse dander sensitive individuals. Varying dilutions of extracts of horse dander, unwashed horsehair and horsehair after it had been prepared for use in mattresses were injected and the reactions noted. In one such instance the horse dander reacted with a dilution of 1:10,000,000 or higher. The unwashed hair gave its first reaction in 1:10,000 dilution and the washed hair in 1:100. In another highly sensitive individual the 1:10,000,000 gave a 3+ reaction, while the first doubtful reaction with the unwashed hair was with 1:1,000 and the extract of washed hair did not react in the strength of 1:50. This would indicate that by far the greatest amount of antigen is removed by the process of cleaning, washing and boiling. The washed hair contains less than $\frac{1}{10,000}$th part of the antigen. However, the fact remains that some horse dander antigen can be demonstrated and it is possible that some horse dander sensitive individuals will have trouble from horsehair as it is found in mattresses.

The practical application of these facts is that a large source of exposure such as a hair mattress should not be inflicted on a horse dander sensitive person, whether he has asthma or vasomotor rhinitis. It is questionable, however, whether a small amount of horsehair such as is found in the seats of chairs or in the padding of coats would be of any particular importance.

THERAPY OF STILL'S DISEASE

To the Editor:—A girl aged 9 years has been suffering from Still's disease for the last three or four years. She has had her tonsils and bad teeth out without any improvement and has been receiving a vaccine—I think Crowe's vaccine—at the hands of another physician. This little girl is becoming deformed and progressively worse. Is there anything which has been found useful in checking the progress of this disease?

M.D., Ontario.

ANSWER.—The following might be suggested as regards treatment:

1. A high caloric, high vitamin diet.
2. Bed rest.
3. Cevitamic acid, 25 mg. a day.
4. Crystalline vitamin B_1, 1 mg. a day.
5. Ten thousand units of vitamin D, each day.

Every effort should be made to prevent further deformities and to correct those already present. This can be accomplished only by means of physical therapy, exercises, and whatever conservative orthopedic measures such as the application of casts and the like are necessary.

Still's disease is at times unrelenting in its progress, despite all forms of therapy. This, however, is the exception rather than the rule. Occasionally one sees striking results from repeated small transfusions. A good conservative, supportive regimen aimed at maintaining as much joint motion as possible, plus the prevention and correction of deformities, should be carried out indefinitely and should never be abandoned even when any of the so-called specific measures are being employed.

TRAUMA AND THROMBOSIS

To the Editor:—A man aged 52 sustained a fracture of the right ascending ramus of the pelvis on Aug. 20, 1938. October 12 he was taken with distress in his chest and shortness of breath without actual pain. October 15 he began to cough, had a fever and developed a bronchial pneumonia. He recovered from the pneumonia after three weeks and on November 9 was taken with a pain in his right leg and the leg became swollen and somewhat discolored. He had a slight fever for ten days. A diagnosis of phlebitis was made. The heart shows some myocardial damage. It was impossible to tell whether the myocardial damage was of recent origin or of old standing. I should like to know how long after an injury it is possible to get a thrombus from the injury. Also can you mention some authorities or literature on this subject. In this case it was nearly three months from the time of the injury to the phlebitis. Could the pneumonia have been due to an infarct? Any information you can give on these subjects will be appreciated.

M.D., New York.

ANSWER.—A pelvic thrombosis following fracture of the pelvis is not infrequent; it may occur a few days after the injury but remain a short "silent" clot in the hypogastric vein without clinical manifestations. Such clots are more apt to give rise to pulmonary emboli than those in the external iliac or femoral veins. Later such clots in the pelvis may extend to the common or external iliac veins and give rise to a typical deep thrombophlebitis.

It is not stated in the query whether or not the patient was steadily immobilized from the time of the injury to the time of the symptoms in the chest; it is possible that this was an infarct, followed by consolidation, but the data supplied do not permit any opinion as to the cause of the bronchopneumonia. Sudden dyspnea with some cyanosis, lobar involvement followed by pleuritic rub, rusty sputum, and the x-ray finding of a triangular infarct with increased hilus shadows on the side of involvement are suggestive of a pulmonary embolus.

The time interval between trauma and thrombosis varies from a few days to several months. If the patient is immobilized as a result of the injury, small initial clots may grow by apposition until some mechanical, physiochemical or climatic stress suddenly makes the process manifest. The longest recorded interval between injury and embolism is the case of Strauss: a man aged 49 died of pulmonary embolism three months after fracturing his patella; eighteen days before death, however, a light embolic shower occurred.

References:

Brahdy, Leopold, and Kahn, Samuel: Trauma and Disease, Philadelphia and London, Lea & Febiger, 1937.

Vance, B. M.: Thrombosis of the Veins of the Extremities and Pulmonary Embolism as a Complication of Trauma, *Am. J. Surg.* **26**: 19 (Oct.) 1934.

DILATION OF CERVIX AND STERILITY

To the Editor:—I have a patient who is anxious to have a baby. She is 30 years old and has been married six years. The family history, menstrual history and physical examination are essentially negative except for a mild case of malarial fever and pyelitis several years ago. A specialist who saw her stated that the mouth of the cervix was too small or closed and that if she had this dilated she would probably become pregnant. Since the menstrual history is essentially negative, I could not understand the rationale of this treatment. Will you please explain? It seems to me that the thing to do in this case would be to make a thorough study of the endocrine system and examine a specimen of semen from the male.

M.D., South Carolina.

ANSWER.—In a case in which menstrual blood can pass downward through the cervical canal there is obviously no anatomic barrier to the upward passage of spermatozoa. Two conditions not infrequently associated with stenosis of the external os require consideration when the complaint is sterility. Of these the first is retention and inspissation of the endocervical mucus, which may form a plug viscous enough to entangle the male cells. The second is female genital hypoplasia, of which a long, conical and anteflexed cervix with a pin-hole os is a familiar stigma. For the latter disorder dilation would be entirely useless. The presence or absence of the first abnormality can be determined precisely by direct observation of the endocervical secretions and by postcoital examination. If it is found to be present, repeated gentle dilations may produce some benefit; but more permanent results are obtained by a small posterior median discision. Otherwise dilation, though a time-honored procedure, has no value. The endocrine balance of the wife should certainly be investigated. It is of primary importance in all cases of sterility to evaluate the husband's semen according to the most critical mathematical standards before subjecting the wife to any elaborate treatment.

AZOOSPERMIA AFTER MUMPS ORCHITIS

To the Editor:—A man of 38 has azoospermia. At the age of 18 years he had bilateral mumps orchitis. It is not known whether he had spermatozoa before that or not. The testes now are about 40 per cent of usual size and apparently of normal consistency. He has developed normally otherwise. The growth of hair on the face is not heavy and there is not much hair on the body. The voice is normal. Sexual desire and ability are quite normal. The blood pressure is 95-100 systolic, 60 diastolic. The pulse at rest is 60, the temperature a little subnormal, the basal metabolism minus 10 per cent. The red cell count is normal, the white count low normal with mild eosinophilia at times. The patient is quite intelligent. He states that he tires easily on mental exertion and has difficulty in concentration. He is inclined to yawn more than normal. His general physical condition is fairly good and he stands physical exertion quite well. Do you believe that the use of anterior pituitary-like substance or testosterone or both would be of value? Have you any other suggestions as to treatment?

M.D., New York.

ANSWER.—At the present time it is not likely that spermatogenesis could be produced in this patient by the administration of the anterior pituitary-like principle from the urine of pregnant women or testosterone. Further observations of the basal metabolic rate should be made, because the level of metabolism is of much more importance than a single test. If the level should prove to be below minus 15 per cent, it should be raised to normal with desiccated thyroid.

SULFANILAMIDE FOR GONORRHEA: DOSAGE IN CHILDREN

To the Editor:—What is the dosage and what are the contraindications for sulfanilamide (oral and parenteral) in the adult in acute and chronic gonorrheal urethritis? Could this drug be given safely to infants and children? If so, in what dosage? What tests should be done in order to find out the tolerance of an office patient to sulfanilamide?

M.D., California.

ANSWER.—The systems of dosage employed by various urologists when sulfanilamide is used in the treatment of gonococcic infections vary somewhat. Probably the most commonly used system for ambulant patients consists of giving from 4 to 5 Gm. of sulfanilamide for two days, from 3 to 4 Gm. a day for five days and then from 2 to 2.5 Gm. a day for a week; this to be followed by 1.3 Gm. a day for two weeks, making the total course of treatment about one month.

The only real contraindication to the use of sulfanilamide is that the patient has previously been given the drug and has had a toxic reaction to the drug. To such a patient a test dose of 0.3 Gm. should be given and the patient kept under observation for possible immediate toxic reaction.

Sulfanilamide may be given with as much safety to infants and children as to adults. Because of a greater fluid intake, children require slightly larger doses of sulfanilamide than do adults. In children severely ill with an infection which may be treated with sulfanilamide the total dose the first day is based on 0.15 Gm. of the drug per pound of body weight. This is divided into six parts and is given at intervals of four hours. In children less severely ill the daily dose is based on 0.07 Gm. per pound of body weight and likewise split into six parts and given at four hour intervals.

Sodium bicarbonate may generally be administered concurrently with sulfanilamide. There is no test for susceptibility to the drug except the administration of a small test dose by mouth.

ASTHMA FROM CONJUGAL ASSOCIATION

To the Editor:—A man aged 32, a miller in a feed mill, has asthmatic attacks. These attacks come on only at night and when his wife is in the house. Previous to meeting his wife before marriage nine years ago the patient never had an attack. He has had complete physical examinations, negative Wassermann tests and forty-two negative pollen and food diagnostic tests. It appears that when his wife is away from home any length of time the attacks cease, but when she returns the attacks return. Being near other women does not bring on any attacks. The patient's wife has tried eliminating all forms of cosmetics and certain types of clothing for several months at a time, with no particular effects. She does not use waveset in her hair or any other form of preparations, such as dye. The patient's occupation does not seem to have any bearing on his case, because, as stated, he does not have any when his wife is away. His attacks are of the severe asthmatic type, which require epinephrine for relief, and this he must take nightly if his wife is at home. For a few years it has been impossible for them to sleep in the same bed at night. It has been suggested that the wife's hair might be the offending cause. Is this likely? A pharmaceutical house wants a pound of hair in order to make a vaccine for treatment. What would be the best procedure to determine the exciting cause of the attacks?

M.D., Pennsylvania.

ANSWER.—The evidence given would certainly seem to incriminate something associated with the wife. Assuming that this information is correct and that no factors other than the wife's surroundings play a part, the obvious thing is to have the wife avoid completely those materials which might possibly bring on asthma in her husband.

First of all, she should use nothing but hypo-allergenic cosmetics. She should especially avoid perfumes during the day as well as during the night. It would also be wise for both husband and wife to use plain soap instead of perfumed soap. By this method one should be able to rule out sensitivity to orris root. Incidentally, the patient himself should use no talcum powder or after-shave lotion except one made by those concerns making nonallergic preparations. It is also possible that the patient is sensitive to silk, and it would be well for the wife to substitute for silk nightgowns either cotton or linen.

Another possibility is that the husband might be sensitive to some contraceptive used by the wife such as a solution or a jelly of some sort. The use of such a preparation should be stopped for a trial. Of paramount importance is the necessity of complete testing of the skin. The query states that only forty-two pollen and food tests were carried out. This is by no means complete, as there are several hundred tests including such substances as feathers, animal danders, silk, kapok, furs, molds and yeasts, and house dust.

Lastly, the patient's occupation might lead to asthmatic attacks. However, it is hard to believe this important, as the attacks come on only at night and only when the wife is in the house.

CONGENITAL AMBLYOPIA

To the Editor:—Please give me some information on congenital amblyopia. What is the consensus as to classification as a functional or organic condition?

M.D., South Dakota.

ANSWER.—Ophthalmologic opinion is still greatly divided as to whether congenital amblyopia is a functional affair or whether it is due to some anatomic failure of development. Thus far no eye with clinically proved congenital amblyopia has ever received microscopic examination, but there seems to be clinical evidence that some cases are organic while others are purely functional. In the higher degrees of congenital amblyopia in which the vision is somewhere between 1/200 and 10/200, central visual acuity can never be developed to a higher degree, indicating an organic malformation as yet undetected. In the second type of case the central vision will vary between 2/200 and 0.2 and it can be improved considerably by continuous occlusion of the fellow eye. In the third type of case the vision will be between 0.2 and 0.6 and it can always be brought up to practically normal if the developmental work is started early enough in life. The latter two types would seem to be more functional than organic.

HEREDITY OF HEMOLYTIC JAUNDICE

To the Editor:—I should appreciate some information on the hereditary factor in hemolytic jaundice. A woman of 19 had her spleen removed with this diagnosis eight years ago. Her mother and two maternal aunts had splenectomies with the same diagnosis. She knows of no other cases in her family history on either side. She now comes asking the question "If I had children is it probable that some of them would have this disease?"

M.D., Massachusetts.

ANSWER.—Hemolytic jaundice seems to be inherited as a "dominant" mendelian character (Campbell, J. M. H., and Warner, E. C.: *Quart. J. Med.* **19**:333 [April] 1926). A dominant mendelian character is inherited directly from parent to child. Of the children half, on the average, will have the character and half will not. The former will again behave like their parents; the latter, provided they marry a normal person, which is almost certain to be the case with such a rare condition, will have normal children. Males and females are affected equally and are equally able to transmit the defect.

Occasionally jaundice is present from birth in a patient whose family history is negative. Such a case probably represents a curious mutation from the ordinary constitution of the family, but the disease will be transmitted as a dominant mendelian character as described (Cyclopedia of Medicine **7**: 593, 1934). The abnormal fragility of the red cells found in hemolytic jaundice may occur in latent cases without the other signs and symptoms of hemolytic jaundice, and it may persist after splenectomy.

LATE ANEMIA NOT RELATED TO SULFANILAMIDE

To the Editor:—In August 1938 I gave a 16 year old boy, living 15 miles out of town, at least 125 grains (8 Gm.) and no more than 150 grains (10 Gm.) of sulfanilamide over a period of four or five days for sore throat. Since he is the son of a telephone operator I heard from him frequently; he became quite cyanotic according to his mother's report and on the second or third night woke up with a "spell" lasting less than an hour, which I thought was a "nightmare" as a result of the gastric irritation. At intervals of two or three days for three or four weeks I had reports that the boy was normal. About the twenty-fifth of this month the boy seemed below par, and his mother took him to a local physician, who found a slight anemia (4 million plus); this physician is wondering whether the anemia might be the result of the action of the sulfanilamide given six months ago. The boy has seemed normal since, and I wish to know whether anemia often if ever lasts six months except following violent reactions.

J. D. MICHIE, M.D., Childress, Texas.

ANSWER.—There is little reason to suspect that an anemia noted six months after a course of sulfanilamide is the result of the patient having taken the drug. The anemias resulting from sulfanilamide therapy are generally acute or subacute hemolytic anemias, which clear up rapidly after the drug is stopped.

X-RAYS AND SCABIES

To the Editor:—How effective are the x-rays in the treatment of scabies? How many units may be used safely, how often repeated, and at what intervals? Do the mercurials, zinc and other metals in ointments or lotions interfere with the use of x-rays? In the case in question the outbreak has been confined to the back of the hand. Various ointments have caused the eruption to abate even to the point of apparent cure, but new outbreaks occur at intervals of two and three weeks. Gloves have been dry cleaned and boiled and bedding also. The history of the case is diagnostic of scabies and the burrows are typical.

M.D., Illinois.

ANSWER.—Given enough x-rays the itch mite and her eggs would be destroyed, but the skin of the patient would also suffer. Scabies requires treatment of the whole skin except that of the head; therefore x-rays are not adapted to its treatment, even though they are known to be effective. Scabies can be eradicated by much simpler means.

Yes, heavy metals and their salts impede the passage of x-rays, depending on the density of the metal, the amount overlying the skin and the character of the rays.

CORNEAL GRAFTING

To the Editor:—Would you outline the indications and contraindications along with the technic of corneal grafting after the methods of Castroviejo and the Russian procedure?

M.D., Pennsylvania.

ANSWER.—The indication for corneal grafting, regardless of the method used, is the presence of an opaque cornea that prohibits the adequate passage of light. The contraindications are somewhat more important and are based on experience. First is a corneal staphyloma, either with or without increased intra-ocular pressure; second, a chronic incurable infection of the tear passages, conjunctiva or cornea; third, calcareous deposits within the cornea; fourth, increased intra-ocular pressure, and fifth, lack of proper light perception. It is fairly well known that the cornea scarred by burns, particularly chemical burns, does not accept a transplant favorably, whereas a corneal transplantation is almost always successful in cases of old interstitial keratitis. There are various gradations between these two extremes.

Description of the Castroviejo and of the Filatov technic is too lengthy for these columns. Briefly, Castroviejo transplants a rectangle of cornea which has been removed by the twin knives that he designed, while Filatov transplants a round button of cornea which has been removed by a rotary trephine. Both surgeons are varying their technic continuously as experience improves their methods and technicians improve their instruments. Much remains to be done, but the results in the hands of these experts are encouraging.

ARGYRIA AND ANTISYPHILITIC TREATMENT

To the Editor:—A syphilitic woman used a mouth wash of strong solution of silver nitrate (lunar caustic sticks dissolved in warm water) for ulcers on her tongue in April 1938. She now shows a dark blue coloring of the skin of her entire body, which is slowly fading. What antisyphilitic treatment is contraindicated and what would be permissible and why?

D. T. COLE, M.D., Anna, Ill.

ANSWER.—There is no contraindication to antisyphilitic treatment in a case of argyria. The silver in the tissues is inert and difficult to affect by any kind of treatment. The claim has been made that argyria has improved after long continued ingestion of iodides but this has not been substantiated (Yandell, L. P.: Cyanosis from Nitrate of Silver Removed by Iodide of Potassium, *Am. Practitioner* **5**:329, 1872). Yandell's patient was given mercury vapor baths before the iodide was used. This is the only evidence that silver once deposited in the tissues is affected by antisyphilitic treatment. Others have tried it and reported no success.

In the case under discussion the syphilis should be treated without regard for the argyria.

TUBERCULOSIS AND ALUMINUM PAINT

To the Editor:—A man aged 24, working in a factory for the last three years spraying aluminum paint, contracted tuberculosis of the lungs. X-ray examination shows tuberculosis of the lungs and no silicosis. He wishes to collect compensation. How can we prove that his work was the cause of his tuberculosis?

M.D., Massachusetts.

ANSWER.—Proof of occupational origin of tuberculosis is rarely possible except in cases in which opportunities for contact with the tubercle bacillus are unusual; for example, nurses in tuberculosis hospitals. Excessive mortality from tuberculosis in any occupational group constitutes presumptive evidence of environmental factors that may depress natural resistance and permit new or preexisting foci of latent infection to cause active clinical disease. Preemployment examinations to prove the absence of such disease before exposure are essential; periodic examinations during exposure must demonstrate its evolution. Extra-occupational contacts with an "open" carrier must be excluded. Evidence is not available of high tuberculosis rates in aluminum spray painters.

VIABILITY OF TUBERCLE BACILLI ON PIPES—FORMALDEHYDE STERILIZATION

To the Editor:—I have been asked by a pipe lover who was bequeathed a fine collection of pipes, including both clay and wood bowls, five years ago by a tuberculous patient whether it would now be safe to smoke the pipes and if not whether there is any available procedure which will make the pipes safe and still not damage their smoking qualities or appearance.

M.D., California.

ANSWER.—Under the conditions mentioned there is no evidence to support the belief that tubercle bacilli would remain viable after five years. Experimental evidence has shown that tubercle bacilli die within sixty to ninety days under conditions in which they cannot metabolize. However, in order to make absolutely certain that no infection can be transmitted the pipes can be safely sterilized without damage to them in formaldehyde fumes.

INTRAVENOUS MEDICATION FOR PYELITIS

To the Editor:—What preparation is used for pyelitis intravenously?

J. LOUIS WALDNER, M.D., Loveland, Colo.

ANSWER.—A 40 per cent solution of methenamine in 5 cc. ampules is obtainable for intravenous administration. Prontosil (the disodium salt of 4-sulfamido-phenol-2′-azo-7′-acetylamino-l′-hydroxynaphthalene-3′,6′ disulfonic acid) is given intravenously. A 2.5 per cent solution is put up in ampules of 5 cc. Neoarsphenamine is given intravenously in a dose of 0.2 Gm. for coccic infections.

Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, April 15, page 1529.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: Parts I and II. Medical centers having five or more candidates desiring to take the examination, May 1-2 (Part II only—limited to a few centers), June 19-21, and Sept. 11-13. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th Street, Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF ANESTHESIOLOGY: An Affiliate of the American Board of Surgery. *Oral* examinations for all candidates, St. Louis, May 13-14. *Written.* Various places throughout the United States, Sept. 9. Applications must be filed by July 11. *Oral.* Part II. Philadelphia, Oct. 14-15. Sec., Dr. Paul M. Wood, 745 Fifth Ave., New York.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: Philadelphia, Oct. 30-Nov. 1. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Various sections of the United States, Oct. 16 and Feb. 19. Formal application must be received before Aug. 20 for the Oct. examination and on or before Jan. 1 for the Feb. examination. Sec., Dr. William S. Middleton, 1301 University Ave., Madison, Wis.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: General oral, clinical and pathological examinations for all candidates, Part II examinations (Groups A and B) will be held in St. Louis, May 15-16. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh (6).

AMERICAN BOARD OF OPHTHALMOLOGY: *Written.* Various cities throughout the country, Aug. 5. *Oral.* St. Louis, May 15 and Chicago, Oct. 7. Sec., Dr. John Green, 6830 Waterman Ave., St. Louis.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: St. Louis, May. Sec., Dr. Fremont A. Chandler, 6 N. Michigan Ave., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: St. Louis, May 12-13 and Chicago, Oct. 6-7. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

AMERICAN BOARD OF PEDIATRICS: Cincinnati, Nov. 15. Appointments must be made before July 15. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: Chicago, May 13. Sec., Dr. Walter Freeman, 1028 Connecticut Ave. N.W., Washington, D. C.

AMERICAN BOARD OF RADIOLOGY: St. Louis, May 11-14. Sec., Dr. Byrl R. Kirklin, 102-110 Second Ave. S.W., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Part II.* New York, May 8 and May 9. Sec., Dr. J. Stewart Rodman, 225 S. 15th St., Philadelphia.

AMERICAN BOARD OF UROLOGY: White Sulphur Springs, W. Va., May 26-28. Sec., Dr. Gilbert J. Thomas, 1009 Nicollet Ave., Minneapolis.

New York September Examination

Mr. Herbert J. Hamilton, chief, Bureau of Professional Examinations, reports the written examination held at Albany, Buffalo, New York and Syracuse, Sept. 19-22, 1938. The examination covered nine subjects. An average of 75 per cent was required to pass. Three hundred and fifty-nine candidates were examined, 221 of whom passed and 138 failed. The following schools were represented:

PASSED

School	Year Grad.	Number Passed
University of Arkansas School of Medicine	(1938)	1
Georgetown University School of Medicine	(1937, 5), (1938, 3)	8
Loyola University School of Medicine	(1938, 2)	2
Northwestern University Medical School	(1936), (1938)	2
Rush Medical College	(1937, 4), (1938)	5
School of Med. of the Division of Biological Sciences	(1934)	1
University of Illinois College of Medicine	(1933)	1
University of Kansas School of Medicine	(1935)	1
University of Louisville School of Medicine	(1938)	1
Johns Hopkins University School of Medicine	(1936)	1
Boston University School of Medicine	(1937)	1
Harvard University Medical School	(1937), (1938)	2
Tufts College Medical School	(1922), (1934), (1937)	3
University of Michigan Medical School	(1935), (1937), (1938)	3
St. Louis University School of Medicine	(1935)	1
Columbia Univ. College of Physicians and Surgeons	(1938, 5)	5
Long Island College of Medicine	(1936), (1937, 2)	3
New York Medical College and Flower Hospital	(1938, 2)	2
New York University College of Medicine	(1934), (1936), (1937, 4), (1938, 7)	13
Syracuse University College of Medicine	(1938, 3)	3
University of Buffalo School of Medicine	(1938, 3)	3
University of Rochester School of Medicine	(1934)	1
University of Oregon Medical School	(1936)	1
Hahnemann Medical College and Hospital of Philadelphia	(1937), (1938)	2
Jefferson Medical College of Philadelphia	(1937), (1938)	2
Temple University School of Medicine	(1936), (1938)	2
University of Pennsylvania School of Medicine	(1937)	1
Woman's Medical College of Pennsylvania	(1937), (1938, 3)	4
Queen's University Faculty of Medicine	(1937, 2)	2
McGill University Faculty of Medicine	(1936), (1937)	2
Karl-Franzens-Universität Medizinische Fakultät, Graz	(1932)	1
Medizinische Fakultät der Universität Wien	(1919, 2), (1921), (1922), (1923), (1927), (1930), (1931), (1932), (1933), (1936, 4), (1937, 5), (1938, 7)	26
Deutsche Universität Medizinische Fakultät, Prag	(1929), (1934), (1935)	3
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	(1937)	1
Université de Paris Faculté de Médecine	(1937), (1938, 4)	5
Université de Strasbourg Faculté de Médecine	(1916), (1938)	2
Université de Toulouse Faculté de Médecine et de Pharmacie	(1932)	1
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1924), (1936)	2
Albertus-Universität Medizinische Fakultät, Königsberg	(1918), (1922), (1923), (1937)	4
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1901), (1910), (1914), (1916, 2), (1921, 2), (1922, 2), (1924, 2), (1929), (1931), (1934), (1936)	15
Georg August-Universität Medizinische Fakultät, Göttingen	(1917)	1
Hamburgische Universität Medizinische Fakultät	(1920)	1
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main	(1922), (1923, 2), (1927), (1936), (1938)	6
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg	(1928)	1
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1898), (1920), (1921), (1934), (1936)	5
Medizinische Akademie Düsseldorf	(1933)	1
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn	(1938, 2)	2
Schlesische-Friedrich-Wilhelms-Unviersität Medizinische Fakultät, Breslau	(1914), (1919), (1920), (1922), (1923, 2), (1924, 2), (1926), (1933), (1934), (1935)	12
Universität Heidelberg Medizinische Fakultät	(1921), (1922), (1934), (1937)	4
Universität Köln Medizinische Fakultät	(1923)	1
Universität Leipzig Medizinische Fakultät	(1911)	1
Universität Rostock Medizinische Fakultät	(1920)	1
Vereinigten Friedrichs-Universität Medizinische Fakultät, Halle-Wittenberg	(1932)	1
Magyar Királyi Ferencz József Tudományegyetem Orvostudományi Kara, Szeged	(1933)	1
National University of Ireland	(1937)	1
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia	(1935), (1936)	2
Regia Università degli Studi di Firenze. Facoltà di Medicina e Chirurgia	(1932), (1935)	2
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia	(1936, 2)	2
Regia Università degli Studi di Siena. Facoltà di Medicina e Chirurgia	(1936)	1
Regia Università di Pisa Facoltà di Medicina e Chirurgia	(1936)	1
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow	(1935), (1936), (1937), (1938, 5)	8
University of Glasgow Medical Faculty	(1924), (1926)	2
University of St. Andrews Conjoint Medical School, Scotland	(1936)	1
Universität Basel Medizinische Fakultät	(1935, 2), (1936, 3)	5
Universität Bern Medizinische Fakultät	(1935, 2), (1936), (1937, 6), (1938, 4)	13
Universität Zürich Medizinische Fakultät	(1936)	1
Université de Genève Faculté de Médecine	(1933), (1935)	2
Université de Lausanne Faculté de Médicine	(1935), (1937), (1938)	3

FAILED

School	Year Grad.	Number Failed
Georgetown University School of Medicine	(1934)	1
Loyola University School of Medicine	(1937, 2), (1938)	3
Rush Medical College	(1937)	1
Columbia University College of Physicians and Surgeons	(1923), (1938)	2
Long Island College of Medicine	(1935)	1
New York University College of Medicine	(1938)	1
Hahnemann Med. College and Hospital of Philadelphia	(1937)	1
Jefferson Medical College of Philadelphia	(1912)	1
Temple University School of Medicine	(1937)	1
Karl-Franzens-Universität Medizinische Fakultät, Graz	(1933)	1
Medizinische Fakultät der Universität Wien	(1919), (1920), (1921), (1924), (1925), (1931), (1932), (1936), (1937, 2), (1938)	11
Deutsche Universität Medizinische Fakultät, Prag	(1922), (1934), (1937)	3
Université de Nancy Faculté de Médecine	(1936)	1
Université de Paris Faculté de Médecine	(1937), (1938)	2
Université de Strasbourg Faculté de Médecine	(1908)	1
Albertus-Universität Medizinische Fakultät, Königsberg	(1911), (1927)	2
Eberhard-Karls-Universität Medizinische Fakultät, Tübingen	(1922)	1
Friedrich-Alexanders-Universität Medizinische Fakultät, Erlangen	(1922)	1
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1904), (1912), (1913), (1920, 2), (1921), (1922), (1923, 2), (1924), (1925), (1926), (1929), (1930), (1934), (1935), (1936, 2), (1937, 3)	21
Georg August-Universität Medizinische Fakultät, Göttingen	(1921), (1937)	2
Hamburgische Universität Medizinische Fakultät	(1922), (1935), (1936)	3
Hessische Ludwigs-Universität Medizinische Fakultät, Giessen	(1909), (1910)	2
Johann Wolfgang Goethe-Universität Medizinische Fakultät, Frankfurt-am-Main	(1919), (1922), (1931), (1938)	4
Julius-Maximilians-Universität Medizinische Fakultät, Würzburg	(1903), (1920), (1922, 2), (1928)	5
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1913), (1923, 3), (1935), (1937)	6
Rheinische Friedrich-Wilhelms-Universität Medizinische Fakultät, Bonn	(1920), (1938, 2)	3
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau	(1914), (1919), (1924)	3
Thüringische Landesuniversitat Medizinische Fakultät, Jena	(1919)	1
Universität Heidelberg Medizinische Fakultät	(1910), (1922, 2), (1923), (1924)	5

Universität Köln Medizinische Fakultät.....(1923), (1924) 2
Universität Leipzig Medizinische Fakultät (1902), (1911), (1923), (1925), (1936)..... 5
Vereinigten Friedrichs-Universität Medizinische Fakultät, Halle-Wittenberg .....(1919) 1
Magyar Királyi Erzsébet Tudományegyetem Orvostudományi, Pecs .....(1926) 1
Regia Università degli Studi di Bologna. Facoltà di Medicina e Chirurgia.....(1936, 2) 2
Regia Università degli Studi di Pavia. Facoltà di Medicina e Chirurgia.....(1937) 1
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia.....(1932), (1935, 2), (1936, 7)..... 10
Regia Università degli Studi di Siena. Facoltà di Medicina e Chirurgia .....(1937) 1
Regia Università di Napoli Facoltà di Medicina e Chirurgia .....(1932), (1936, 3), (1938) 5
Regia Università di Pisa Facoltà di Medicina e Chirurgia .....(1934), (1937) 2
Uniwersytet Jozefa Pilsudskiégo, Warszawa.....(1930) 1
Licentiate of the Royal College of Physicians, of the Royal College of Surgeons, Edinburgh, and of the Royal Faculty of Physicians and Surgeons, Glasgow (1937), (1938, 2) 3
Universität Basel Medizinische Fakultät (1935), (1936, 2), (1937) 4
Universität Bern Medizinische Fakultät (1934), (1936), (1937), (1938) 4
Universität Zürich Medizinische Fakultät....(1935), (1937, 2) 3
Université de Genève Faculté de Médecine.....(1930), (1937) 2
University of Istanbul Medical Faculty.....(1916) 1

Twenty-three physicians were licensed by endorsement from December 11 through December 31. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Yale University School of Medicine	(1936), (1937)		N. B. M. Ex.
Georgetown University School of Medicine	(1937)		N. B. M. Ex.
Howard University College of Medicine	(1938)		N. Carolina
University of Georgia Medical Department	(1925)		Georgia
University of Louisville Medical Department	(1917)		Vermont
Johns Hopkins University School of Medicine	(1919)		N. Carolina
Harvard Medical School	(1937)		N. B. M. Ex.
St. Louis University School of Medicine	(1938)		Tennessee
New York Medical College and Flower Hospital	(1937)		N. B. M. Ex.
Eclectic Medical College, Cincinnati	(1938)		Ohio
Hahnemann Med. College and Hospital of Philadelphia	(1923)		New Jersey
Jefferson Medical College of Philadelphia	(1928)		Penna.
Medico-Chirurgical College of Philadelphia	(1915)		Penna.
University of Pennsylvania School of Medicine	(1931)		N. B. M. Ex.
University of Tennessee College of Medicine	(1932)		Tennessee
Baylor University College of Medicine	(1938)		Texas
Medical College of Virginia	(1935)		N. B. M. Ex.
Marquette University School of Medicine	(1938)		N. B. M. Ex.
Medizinische Fakultät der Universität Wien	(1924)		New Jersey
Deutsche Universität Medizinische Fakultät, Prag	(1931)		New Jersey
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1934)		Maryland
University of Kharkov Faculty of Medicine	(1915)		Russia

New Jersey Endorsement Report

Dr. E. S. Hallinger, secretary, State Board of Medical Examiners of New Jersey, reports 152 physicians licensed by endorsement during 1938. The following schools were represented:

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Arkansas School of Medicine	(1937, 3)		Arkansas, (1937) New York
College of Medical Evangelists	(1925) Idaho, (1938)		N. B. M. Ex.
University of Southern California School of Medicine	(1937)		California
Yale University School of Medicine	(1933), (1935)		N. B. M. Ex.
George Washington University School of Medicine	(1927)		New York, (1935) Maryland
Georgetown University School of Medicine	(1928)		New York, (1935), (1936, 2), (1937) N. B. M. Ex.
Howard University College of Medicine	(1925)		Ohio, (1934) N. B. M. Ex., (1936) Tennessee
University of Georgia School of Medicine	(1937)		Georgia
Indiana University School of Medicine	(1936)		Indiana
State University of Iowa College of Medicine	(1910), (1930), (1935), (1936), (1937)		Iowa
University of Louisville School of Medicine	(1928)		New York, (1936), (1937) Kentucky
Louisiana State University Medical Center	(1938)		Louisiana
Johns Hopkins University School of Medicine	(1916)		New York, (1933) Maryland
University of Maryland School of Medicine and College of Physicians and Surgeons	(1934)		Colorado, (1934), (1935, 3), (1936, 2) Maryland
Boston University School of Medicine	(1926)		N. B. M. Ex., (1931) Massachusetts, (1935) New York
Harvard Medical School	(1936)		N. B. M. Ex.
Tufts College Medical School	(1918)		New York, (1927) Massachusetts, (1931) Maine
University of Michigan Medical School	(1933), (1936)		Michigan
University of Minnesota Medical School	(1935)		Minnesota
St. Louis University School of Medicine	(1936)		Penna., (1937) Missouri
Washington University School of Medicine	(1934)		Missouri
Albany Medical College	(1936)		New York
Columbia University College of Physicians and Surgeons	(1933), (1934), (1936)		N. B. M. Ex., (1921), (1933), (1934, 2), (1935), (1936, 2), (1937) New York
Cornell University Medical College	(1928), (1935)		New York, (1927), (1931), (1933), (1934), (1936) N. B. M. Ex.
Long Island College Hospital	(1907, 2)		New York
Long Island College of Medicine	(1934)		New York
New York Homeopathic Medical College and Flower Hospital	(1933), (1935, 2)		New York
New York Medical College and Flower Hospital	(1936, 2)		N. B. M. Ex.
New York University, University and Bellevue Hospital Medical College	(1930), (1934)		New York
New York University College of Medicine	(1935, 4), (1936, 2)		New York
Syracuse University College of Medicine	(1931), (1937)		New York
Duke University School of Medicine	(1934, 2), (1935)		N. B. M. Ex.
Eclectic Medical College, Cincinnati	(1936, 2), (1937, 2)		Ohio
Western Reserve University School of Medicine	(1933)		Ohio
Hahnemann Medical College and Hospital of Philadelphia (1924), (1930), (1933), (1934)	Penna., (1937)		Maryland, Ohio
Jefferson Medical College of Philadelphia	(1933), (1935)		Penna., (1935) Maryland, (1936) New York
Medico-Chirurgical College of Philadelphia	(1915)		Penna.
Temple University School of Medicine	(1936), (1937, 2)		N. Carolina, (1928), (1934, 2), (1936) Penna.
University of Pennsylvania School of Medicine	(1932)		N. B. M. Ex., (1934), (1936) New York, (1920), (1931), (1937, 2) Penna.
Woman's Medical College of Pennsylvania	(1919), (1935)		New York
University of Vermont College of Medicine	(1908), (1935, 2)		Vermont, (1933) N. B. M. Ex.
Medical College of Virginia	(1935)		Virginia
University of Virginia Department of Medicine	(1928)		Tennessee, (1931), (1935), (1937) Virginia
Marquette University School of Medicine	(1937)		Wisconsin, (1938) N. B. M. Ex.
Dalhousie University Faculty of Medicine	(1937)		N. B. M. Ex.
Queen's University Faculty of Medicine	(1935)		New York
McGill University Faculty of Medicine	(1935)		New York
Univ. of Bishop College Faculty of Medicine, Montreal	(1905)		Maine
Medizinische Fakultät der Universität Wien	(1933), (1936)		New York
Deutsche Universität Medizinische Fakultät, Prag	(1933)		New Hamp.
University of Sheffield Faculty of Medicine	(1935)		New York
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1927)		New York
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin	(1932)		New York
Universität Köln Medizinische Fakultät	(1932)		New York
Regia Università di Napoli Facoltà di Medicina e Chirurgia	(1936)		Maryland
University of Aberdeen Faculty of Medicine	(1905)		New York
Universität Bern Medizinische Fakultät	(1935), (1936)		New York
Universität Zürich Medizinische Fakultät	(1921) Ohio, (1936)		N. B. M. Ex.

District of Columbia Reciprocity and Endorsement Report

Dr. George C. Ruhland, secretary, Commission on Licensure, reports twenty-three physicians licensed by reciprocity and one physician licensed by endorsement from Sept. 15 through Dec. 14, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
George Washington University School of Medicine	(1934)		Maryland
Georgetown University School of Medicine	(1933), (1934)		Maryland
Howard University College of Medicine	(1931)		Penna., (1932) Georgia, (1936) Maryland
Emory University School of Medicine	(1922), (1934), (1935)		Georgia
University of Kansas School of Medicine	(1935)		Kansas
Johns Hopkins University School of Medicine	(1936)		Maryland
St. Louis University School of Medicine	(1936)		Missouri
Columbia Univ. College of Physicians and Surgeons	(1903)		New York
Long Island College Hospital	(1911), (1922)		New York
Western Reserve University School of Medicine	(1935)		Ohio
Hahnemann Med. College and Hospital of Philadelphia	(1935)		Maryland
University of Pennsylvania School of Medicine	(1934)		Penna.
Woman's Medical College of Pennsylvania	(1925)		Penna.
University of Tennessee College of Medicine	(1934)		Tennessee
Medical College of Virginia	(1926)		Penna.
Univ. of Virginia Department of Medicine	(1932), (1936)		Virginia

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
University of Virginia Department of Medicine	(1911)		U. S. Navy

Idaho October Examination

Hon. J. L. Balderston, former commissioner of law enforcement, reports the written examination held by the Idaho State Medical Examining Board, Oct. 3-5, 1938. The examination covered twenty-three subjects and included 160 questions. An average of 75 per cent was required to pass. Fifteen candidates were examined, all of whom passed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1937)		76
University of Colorado School of Medicine	(1937)		79
George Washington University School of Medicine	(1938)		78
Northwestern University Medical School	(1935)		76
Rush Medical College	(1936) 78, (1937)		83
University of Michigan Medical School	(1936)		80
Washington University School of Medicine	(1937)		75
University of Nebraska College of Medicine	(1937)		78
Univ. of Oregon Medical School	(1917) 83, (1936) 85, (1937)		79
University of Texas School of Medicine	(1937)		82
McGill University Faculty of Medicine	(1935)		81
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau	(1935)		75

Louisiana December Report

Dr. Roy B. Harrison, secretary, Louisiana State Board of Medical Examiners, reports the written examination held in New Orleans, Dec. 1-3, 1938. The examination covered twelve subjects and included 100 questions. An average of 75 per cent was required to pass. Twenty-nine candidates were examined, all of whom passed. Fourteen physicians were licensed by reciprocity. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine	(1938)	81.2,	83.9
University of Southern California School of Medicine	(1938)		86.4
Howard University College of Medicine	(1937)		82.2
Emory University School of Medicine	(1936)	82.5, (1938)	85.2
Loyola University School of Medicine	(1937)		82.2*
Northwestern University Medical School	(1938)		82.3
Indiana University School of Medicine	(1937)		83.1
Louisiana State University Medical Center	(1938)	85.3,*	87.4*
Tulane University of Louisiana School of Medicine	(1937)		83.1, 86.6, (1938) 78.9, 79.7, 82.7, 85.2†
University of Maryland School of Medicine and College of Physicians and Surgeons	(1938)	81.8,	84.2
University of Minnesota Medical School	(1938)		83.3*
New York University College of Medicine	(1938)		84.9
University of Oklahoma School of Medicine	(1938)		86.7
University of Cincinnati College of Medicine	(1938)		84*
University of Oregon Medical School	(1938)		85.4
Medical College of the State of South Carolina	(1938)		83.5
Baylor University College of Medicine	(1938)		79.4
University of Virginia Department of Medicine	(1938)		83.3
University of Wisconsin Medical School	(1938)		85.1
Queen's University Faculty of Medicine	(1930)		78.1†

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1937)	Arkansas
Rush Medical College		(1901)	Illinois
Tulane University of Louisiana School of Medicine		(1935)	S. Carolina
University of Michigan Medical School		(1930)	Michigan
University of Minnesota Medical School		(1935)	Minnesota
University of Nebraska College of Medicine		(1933)	Nebraska
Meharry Medical College		(1928)	Tennessee
University of Tennessee College of Medicine		(1932), (1936)	Tennessee
Vanderbilt University School of Medicine		(1935)	Mississippi
Baylor University College of Medicine		(1936)	Texas
Medical College of Virginia		(1931)	Virginia
University College of Medicine, Virginia		(1912)	Virginia
University of Wisconsin Medical School		(1937)	Kansas

* This applicant has completed the medical course and will receive the M.D. degree on completion of internship. License has not been issued.

† Granted a Temporary Permit. License withheld pending completion of United States citizenship.

Wisconsin September Reciprocity Report

Dr. Henry J. Gramling, secretary, Wisconsin State Board of Medical Examiners, reports five physicians licensed by reciprocity at the meeting held in Milwaukee, Sept. 14, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Illinois College of Medicine		(1937)	Illinois
University of Minnesota Medical School		(1931)	Minnesota
Washington University School of Medicine		(1935)	California
University of Nebraska College of Medicine		(1931)	Nebraska
Marquette University School of Medicine		(1936)	Montana

National Board of Medical Examiners

The National Board of Medical Examiners reports that its certificate was awarded to eighty-seven applicants who were successful in the examinations in part III held in the fall of 1938. The following schools were represented:

School	PASSED	Year Grad.	Number Passed
College of Medical Evangelists	(1937),	(1938, 5)	6
Stanford University School of Medicine	(1936),	(1938)	2
University of Colorado School of Medicine	(1937)		1
Yale University School of Medicine	(1937, 2)		2
George Washington University School of Medicine	(1937)		1
Georgetown University School of Medicine	(1937, 3)		3
University of Georgia School of Medicine	(1937)		1
Northwestern University Medical School	(1938)		1
State University of Iowa College of Medicine	(1937)		1
Johns Hopkins University School of Medicine	(1933),	(1937, 5)	6
Boston University School of Medicine	(1936),	(1937, 11)	12
Harvard Univ. Medical School	(1935, 5),	(1936, 5), (1937, 2)	12
Tufts College Medical School	(1932),	(1936), (1937, 5)	7
University of Michigan Medical School	(1935),	(1937)	2
St. Louis University School of Medicine	(1935),	(1937)	2
University of Nebraska College of Medicine	(1936)		1
Columbia University College of Physicians and Surgeons	(1936)		1
Cornell University Medical College	(1936)		1
New York Medical College and Flower Hospital	(1937, 6)		6
Syracuse University College of Medicine	(1936)		1
Duke University School of Medicine	(1934),	(1937)	2
University of Oklahoma School of Medicine	(1937)		1
University of Pennsylvania School of Medicine	(1936)		1
University of Vermont College of Medicine	(1936),	(1937, 5)	6
Marquette University School of Medicine	(1938)		1
University of Wisconsin Medical School	(1935)		1
McGill University Faculty of Medicine	(1937, 2)		2
Licentiate of the Royal College of Physicians of London and Member of the Royal College of Surgeons of England	(1935)		1
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1935)		1
Universität Bern Medizinische Fakultät	(1937)		1
Université de Lausanne Faculté de Médecine	(1920)		1

Ohio May-June Examination

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports the oral, written and practical examination held at Columbus, May 31-June 3, 1938. The examination covered ten subjects and included eighty questions. An average of 75 per cent was required to pass. Three hundred and five candidates were examined, 297 of whom passed and eight failed. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
College of Medical Evangelists	(1938)		82.1
Loyola University School of Medicine	(1938, 7)*		
Northwestern University Medical School	(1937)		81.5, (1938) 81.7, 86.9, 87.8
Rush Medical College	(1937)	81.8, (1938)	83.5, 87.7
School of Medicine of the Division of Biological Sciences	(1937)		88.1
University of Illinois College of Medicine	(1938)		86.9
University of Minnesota Medical School	(1932)	77.3, (1933)	88.5
Creighton University School of Medicnie	(1937)		81.6
University of Rochester School of Medicine	(1938)		80.6, 82.8, 82.9, 84.2, 85.6, 87.4, 87.8
Eclectic Medical College, Cincinnati	(1938)		80.2, 81.3, 81.5, 82.3, 82.3, 83.2, 83.3, 83.4, 83.6, 83.9, 84, 84.2, 84.3, 84.3, 84.4, 84.6, 84.8, 85.1, 85.2, 85.3, 85.5, 85.6, 86.8, 86.8, 87.1, 87.2, 87.2, 87.3, 87.6, 88.1, 88.4, 89.7
Ohio State University College of Medicine	(1938)		79.4, 79.7, 79.8, 80.3, 80.4, 80.5, 80.5, 80.7, 80.8, 81, 81.1, 81.3, 81.4, 81.5, 81.6, 81.7, 81.8, 81.9, 82.1, 82.1, 82.2, 82.2, 82.2, 82.3, 82.4, 82.4, 82.4, 82.4, 82.5, 82.8, 82.9, 83.1, 83.1, 83.1, 83.2, 83.4, 83.4, 83.4, 83.5, 83.5, 83.6, 83.6, 83.6, 83.6, 83.7, 83.7, 83.8, 83.8, 83.9, 83.9, 83.9, 83.9, 84, 84.1, 84.2, 84.3, 84.5, 84.6, 84.7, 84.7, 84.7, 84.8, 84.8, 84.9, 84.9, 85.1, 85.2, 85.2, 85.3, 85.4, 85.5, 85.8, 85.9, 85.9, 85.9, 86.1, 86.3, 86.4, 86.5, 86.5, 86.7, 86.8, 86.9, 87.2, 87.3, 87.3, 87.4, 87.7, 87.8, 88.1, 90.3
University of Cincinnati College of Medicine	(1938)†		80.3, 80.6, 80.6, 80.9, 81, 81.2, 81.3, 81.4, 81.4, 81.9, 81.9, 81.9, 82, 82, 82.1, 82.4, 82.6, 82.7, 83.1, 83.2, 83.2, 83.3, 83.4, 83.4, 83.4, 83.5, 83.6, 83.7, 84, 84, 84, 84, 84, 84.1, 84.1, 84.1, 84.1, 84.2, 84.2, 84.2, 84.3, 84.6, 84.6, 84.8, 85, 85.1, 85.2, 85.3, 85.3, 85.4, 85.4, 85.5, 85.7, 85.8, 85.8, 85.9, 86, 86.1, 86.2, 86.2, 86.3, 87.3, 87.4, 87.9, 88.5, 88.7
Western Reserve University School of Medicine	(1938)		79.5, 79.8, 80.3, 80.8, 80.8, 81.2, 81.4, 81.4, 81.7, 82, 82.3, 82.4, 82.4, 82.9, 83.3, 83.4, 83.5, 83.6, 83.7, 83.7, 83.7, 83.9, 83.9, 84, 84.1, 84.3, 84.3, 84.3, 84.4, 84.5, 84.6, 84.7, 84.7, 84.9, 84.9, 84.9, 85, 85.1, 85.1, 85.3, 85.5, 85.7, 85.7, 85.7, 85.7, 85.7, 85.9, 86, 86, 86.3, 86.5, 86.5, 86.5, 86.6, 86.7, 86.8, 86.8, 87.4, 87.8, 87.8, 88.7
Jefferson Medical College of Philadelphia	(1937)		84.7
University of Pennsylvania School of Medicine	(1937)		84.7
Woman's Medical College of Pennsylvania	(1938)		83.9
Marquette University School of Medicine	(1938)	82.2, 82.4, 82.5,	82.8,‡
University of Toronto Faculty of Medicine	(1937)		85.9
McGill University Faculty of Medicine	(1938)		81.7
Medizinische Fakultät der Universität Wien	(1937)		83.7
Deutsche Universität Medizinische Fakultät, Prag	(1927)		76.3
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg	(1917)		78
Christian-Albrechts-Universität Medizinische Fakultät, Kiel	(1925)		77.7
Georg August-Universität Medizinische Fakultät, Göttingen	(1919)		76.8
Hessische Ludwigs-Universität Medizinische Fakultät, Giessen	(1927)		78.7
Ludwig-Maximilians-Universität Medizinische Fakultät, München	(1937)		80.5
Universität Heidelberg Medizinische Fakultät	(1931)		80.6
Regia Università degli Studi di Roma. Facoltà di Medicine e Chirurgia	(1936)		77.5
Licentiate of the Royal College of Physicians, Licentiate of the Royal College of Surgeons, Edinburgh, and Licentiate of the Royal Faculty of Physicians and Surgeons, Glasgow	(1937)		81.9

School	FAILED	Year Grad.
Loyola University School of Medicine		(1938)
Université de Paris Faculté de Médecine		(1926)
Albert-Ludwigs-Universität Medizinische Fakultät, Freiburg		(1929)
Ludwig-Maximilians-Universität Medizinische Fakultät, München		(1907)
Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau		(1917)
Universität Heidelberg Medizinische Fakultät		(1908)
Regia Università degli Studi di Genova. Facoltà di Medicina e Chirurgia		(1924)
Université de Lausanne Faculté de Médecine		(1936)

* These applicants have completed the medical course and will receive the M.D. degree on completion of internship. Licenses have not been issued.

† These applicants have received the M.B. degree and will receive the M.D. degree on completion of internship.

‡ This applicant has completed the medical course and will receive the M.D. degree on completion of internship. License has not been issued.

Book Notices

The Relation Between Injury and Disease. By Jewett V. Reed, B.S., M.D., F.A.C.S., Assistant Professor of Surgery, Indiana University, Indianapolis, and Charles P. Emerson, A.B., M.D., D.Sc., Research Professor of Medicine, Indiana University. Collaborating: E. B. Mumford, B.S., M.D., F.A.C.S., Consultant U. S. Veterans Bureau Hospital. Cloth. Price, $7.50. Pp. 577, with 21 illustrations. Indianapolis: Bobbs-Merrill Company, 1938.

A new and strange pseudopathology has been slowly evolving in the courts, based on so-called expert medical testimony, especially in connection with diseases of industrial workers, alleged to be the result of injury. This strange pseudopathology will become more and more unscientific unless physicians in court become more determined to substitute propter hoc reasoning for the post hoc arguments which in many cases determine decisions. Physicians in cases of injury in which there is an element of liability recognize that many of the settlements made are unfair if judged on their scientific merits although just in view of the medical testimony presented to the court. Many injured persons receive little or nothing for physical disabilities justly compensable, while others receive awards for diseases not due to injury. The purpose of this book is to reduce the number of such injustices. It is designed to be helpful especially to (1) lawyers who present accident cases before courts and boards, (2) officials of insurance companies which carry casualty risks and (3) physicians and surgeons. It is based on the authors' thirty-six years of experience. Their discussions are limited to well recognized diseases; in some injury may be a primary etiologic factor, in others it never is and in still others it may modify the course. In the study of cases in which trauma and disease are assumed to be associated the physician should critically scrutinize the history of the accident and separate the actual facts of the injury from the statements given by the patient. He should also have personal knowledge of all the features of the patient's disease and be accurately informed as to all the factors which could possibly have entered into its cause.

Nouvelle pratique dermatologique. Publiée par MM. Darier, Sabouraud, Gougerot, Milian, Pautrier, Ravaut, Sézary, Clément Simon. Secrétaire Général: Clément Simon. Tome VIII. Dermatologie topographique; thérapeutique; médecine légale; table alphabétique. Par MM. P. Blum et al. Half-Cloth. Price, 300 francs. Pp. 867, with 178 illustrations. Paris: Masson & Cie, 1936.

The first 380 pages of volume VIII, which brings to a close this huge work, are devoted to topographic dermatology. This is of great value to the general practitioner but of much less value to the specialist in that it is largely repetitious. It is interesting, however, owing to the fact that it is the first contribution of its kind since the work of Sabouraud, which appeared in 1905 and which was translated into several languages.

Sabouraud and Pignot in fifty-two pages cover the semeiology of the scalp. About the same number of pages are taken up by Bory on the topographic dermatology of the face and nose. The illustrations in this article are numerous and excellent. Fernet follows with about eighty pages on the lips, mouth and tongue. This constitutes a valuable contribution to the volume and, although the illustrations are not as numerous as in the preceding article, they are in sufficient number and of the highest quality. A short paper by Montlaur on the topographic dermatology of the large folds is thorough and of much value even to the specialist. Thorel contributes a short article on the male external genitalia and Bralez does the same on the female external genitalia. The illustrations in both are all that could be desired. Gonin gives a few paragraphs to each of the many conditions affecting the anal region. Burnier makes the most of the pages allotted him to list and describe the disorders of the hands and feet. Payenneville describes the dermatoses of the mammae, and Blum those of the umbilicus.

The second half of the volume is devoted to therapeutics, plastic surgery and medicolegal dermatology with an introduction by Darier. Fernet discusses the general hygiene of the skin and scalp. This is followed by forty-four pages on general therapy by Darier and Dreyfus. Included are such subjects as internal treatment of cutaneous accidents, treatment of the cutaneous sensitization by hemotherapy and serotherapy, peptone therapy, lactotherapy, urinotherapy and the use of the "substance P" of Oriel, heat therapy, vaccinotherapy and chemotherapy. Under the last heading the drugs used in dermatology are listed alphabetically and discussed in detail. The various regimens are then taken up, acid and alkaline regimens, the methods of modifying the metabolism of the skin, modification of the vitamin equilibrium, uric acid, the fats and the proteins. Glandular therapy is thoroughly covered, after which the chapter is ended with several pages devoted to treatment of the central nervous system.

Fernet and Heurre contribute an exhaustive article of forty pages to internal treatment of the dermatoses, sixteen pages to pharmaceuticals and forty-two pages to external treatment.

The physical agents used in dermatology are discussed and evaluated by Girondeau. The author describes the indications for and the technic of the use of the douche filiforme, hot air, actinotherapy, infra-red high frequency currents, the diathermic or electric bistoury, the galvanic current, electrolysis, ionization and electrical baths.

Cottenot covers, as well as any one could in forty-three pages, the technic and the results of the use of the roentgen ray and radium in dermatology. Solente describes the preparation of carbon dioxide snow and the technic of its application to lesions of the skin. Although many dermatologists hesitate to treat epitheliomas with the snow, the author does not hesitate to use it in selected cases and finds the results superior to those of any other method.

Ravaut has thoroughly covered the field of electrocoagulation in forty pages. There are many illustrations showing the marvelous results it is possible to attain with this method. The pictures of the epitheliomas of the face and the left hand and of the melanomas of the face and the foot are particularly impressive.

An excellent chapter on plastic surgery is contributed by Dufourmentel. The technic for face lifting and for correction of various deformities of the face is set forth in much detail and illustrated with line drawings. A most interesting part of the chapter is the method of correcting ptosis of the mammae. The illustrations shown before and after treatment would seem to indicate conclusively that the technic is highly successful in such cases.

The volume closes with a chapter on medicolegal dermatology by Vivatte and Sidi. Obviously this chapter, which is thorough, is primarily for the French and has little to offer to dermatologists of other countries.

An excellent index of sixty-eight pages is appended.

Giants of Medicine in Pioneer Kentucky: A Study of Influences for Greatness. By William Allen Pusey, A.M., M.D., LL.D. [Reprinted from February 1938 issue of Medical Life.] Boards. Pp. 35-64. New York: Froben Press, 1938.

Having been reared in Kentucky and having personal knowledge of its geography, its people and its resources, William Allen Pusey is in the fortunate position of being able to portray the courage, resourcefulness, vision and ability of its pioneers and with a facile pen to pay tribute to their attainments. This he has interestingly and adequately done. The circumstances under which these pioneers lived and worked, including a lack of hospitals, of trained nursing personnel, of a knowledge of surgical cleanliness, of instruments of precision as we now know them, of the aid of the blessed insensibility of anesthesia and the presence of inherent and seemingly insuperable difficulties, make the incredulity of their contemporaries readily understandable and emphasize their claims to renown for the development of greatness. Bardstown, with the most illustrious courts and bar in the West, had but 820 inhabitants when Brashear did the first hip joint amputation in 1806. Danville, with McDowell's home under the shadow of the state capitol, had but 432 inhabitants in 1809, when he did his first ovariotomy, and but 804 at the time of his death in 1830. Lexington, the Athens of the West, then as now a remarkable town in a wonderful country, had but 1,795 inhabitants at the time of the establishment of the medical school, Transylvania University, in 1799, and but 6,997 when Dudley was at the zenith of his career. In his study of the influences for greatness to be found in a then virgin country, inhabited by hostile savages and the beasts of the forest, Dr. Pusey gives due credit to the type of people who settled this frontier, well equipped physically, mentally and socially for the struggle of the survival of the fittest. They

were well endowed with those qualities for which Americans are noted the world over, independence of thought, enthusiasm of purpose, courage to undertake and patience to carry through: in the words of Dr. Pusey "a vigorous breed of men trained to its highest efficiency by the exactions of frontier life." Written in beautiful clear language, this history of medical pioneers proves an entrancing one.

Der Magenkrebs. Von Dr. med. Georg Ernst Konjetzny, o. ö. Professor der Chirurgie der Hansischen Universität, Hamburg. Cloth. Pp. 289, with 155 illustrations. Stuttgart: Ferdinand Enke, 1938.

Konjetzny, one of the foremost authorities on the subject, summarizes thirty years of study of the problem of gastric carcinoma. He reaffirms the views previously published, coordinates the data, adds much new material and presents a complete picture of our present knowledge of the genesis of gastric carcinoma and its clinical application. In the introduction he calls attention to the well known fact that the stomach is the organ most frequently affected by carcinoma and that today the majority of patients so afflicted come to the internist and the surgeon too late for cure. In the battle against gastric carcinoma only two possibilities exist: prophylaxis or early radical surgical treatment. Under the heading of etiology Konjetzny discusses first the rôle of heredity and concludes that cancer as such is not inherited, only a certain tendency or organ disposition. External conditions are thought to be the more important factors. The theory of contagiousness and infectivity seems disproved, as does the Cohnheim concept of carcinoma arising from embryonal cells left over after the development of the fetus and its organs. Trauma is considered significant only as it relates to the sequelae of corrosion of the mucosa, as in acid or alkali poisoning. Virchow's theory of carcinoma as a resultant of local disease processes is accepted, and a large section of the monograph is devoted to the thesis that "the chronic inflammatory conditions which demand greatest consideration as the basis of gastric carcinoma formation are the chronic gastritis with its sequelae and the chronic gastric ulcer."

Konjetzny's life work indeed has been the study of the relationship between chronic gastritis, benign ulcer and carcinoma. He views gastritis as the basis for both ulcer and carcinoma. In his experience gastric carcinoma is always associated with a pronounced chronic atrophic or atrophic-hyperplastic gastritis. Carcinoma never develops in a normal gastric mucosa. The essential process in the gastritis-carcinoma relationship is not the inflammation but regenerative changes in the epithelium constantly induced by it. The complete transition from pure gastritic changes to polyp formation and carcinoma is described in detail and well documented with convincing illustrations. The carcinomatous development begins in the cells over a broad area of the mucosa and hence is multicentric in origin. The subject of carcinomatous transformation of a benign ulcer is discussed at length. The conclusion is reached that it is not possible by clinical methods alone to make such a diagnosis. Pathologic evidence, especially the histologic, is more definite, but here also difficulties exist. The diagnosis cannot be made on the basis of any single pathognomonic finding but rather by a careful analysis of all the evidence. Carcinoma may develop in the edge of a benign ulcer or adjacent to the ulcer but independent of it, related not to the ulcer but to the gastritis, to which Konjetzny attributes both the ulcer and the carcinoma. With regard to the differentiation of ulcer-gastritis and carcinoma-gastritis Konjetzny says that in ulcer the gastritis is usually more acute and is localized to the antrum whereas in carcinoma the gastritis tends to be more chronic and to involve larger areas of the gastric mucosa. There is, however, no specific or fundamental difference.

Among the macroscopic forms of carcinoma Konjetzny distinguishes (1) the pronounced mushroom or polypoid tumor, which develops chiefly in the lumen of the stomach, (2) the ulcerated dishlike growth with clearly defined borders, (3) the ulcerated carcinoma without a definite wall or a sharp border and with infiltration of the gastric wall beyond the edge of the ulcer and (4) the definitely diffuse type in which the borders of the tumor are not palpable, usually beginning in the antrum, and consisting particularly of the so-called linitis plastica and carcinoma fibrosum. The microscopic types are variable and are not to be correlated with the macroscopic. The prognosis for surgical treatment is, on the whole, much better in the first and second groups than it is in the third and fourth. A histologic classification is not of much prognostic value.

Effective therapy depends first on early examination and second on gastric resection of all early carcinomas and indeed of all cases of polypoid gastritis, this being definitely a precarcinomatous, if not already carcinomatous, condition. All patients with digestive symptoms should report promptly to the physician, who should use all available diagnostic means necessary for the establishment of a definite diagnosis. The history, physical examination and gastric analysis are not sufficient but should be combined with a search for occult blood in the stool and with careful roentgenologic and gastroscopic examination. These methods are most valuable. The author is opposed to exploratory laparotomy as a diagnostic procedure because the methods mentioned are reliable and also because small carcinomas often cannot be palpated even when the surgeon has the stomach in his hands. When a portion of the stomach is held in suspicion clinically, it should be resected. Resection should be carried out in almost all cases of carcinoma even though a very radical operation is required, such as complete gastrectomy or partial gastrectomy combined with partial colectomy. The chief contraindications to resection are definite, proved distant metastases or extensive carcinomatous peritonitis. Significant palliative effects have been obtained even when Krukenberg tumors had to be removed in addition to the gastric lesion. In spite of the fact that Hitzenberger and Merkler found thirteen year cures in only 2 per cent of 272 patients with gastric carcinoma, Konjetzny feels that undue pessimism is not warranted even in the young. The longest cure observed in the Breslau clinic was that of a man operated on when 31 years old and was known to be well twenty-one years later. With earlier diagnosis and earlier radical resection, better results should be obtained.

Essentials of Medicine. By Charles Phillips Emerson, M.D., Research Professor of Medicine, Indiana University, Indianapolis, and Nellie Gates Brown, R.N., Director of Training School for Nurses, Ball Memorial Hospital, Muncie, Indiana. Thirteenth edition. Cloth. Price $3. Pp. 845, with 164 illustrations. Philadelphia, Montreal & London: J. B. Lippincott Company, 1938.

The evolution of this volume through thirteen editions since 1908 has been an account of medical and nursing school programs during the last thirty years. Originally intended as a primer for the medical student's study of disease, the book at present is chiefly in the hands of the student nurse. The authors in preparing this edition have patterned it on the unit plan, following suggestions in the curriculum guide for schools of nursing. A section of doubtful value is the one intended to encompass the field of public health and medical sociology, an impossible task in five pages. Furthermore, with the mention of a drug such as sulfanilamide, the failure to list and discuss the toxic signs and symptoms is a real error, especially at a time when all are interested in this new drug and its dangers. The student nurse here has presented for her the essentials of medicine in a concise yet readable 1, 2, 3 form. The volume should continue to be one of the most popular in the series of nursing manuals.

Malaria in the Netherlands. By N. H. Swellengrebel and A. de Buck. Cloth. Price, 5 florins. Pp. 267, with 25 illustrations including 2 plates. Amsterdam: Scheltema & Holkema, Ltd., 1938.

The authors, both from the Institute of Tropical Hygiene of Amsterdam, have presented an interesting book on an old but ever changing and expanding theme. One might think that such a subject would be dry and uninteresting, but this book is presented in such a way that it easily holds the attention. The authors have done a perfectly tremendous amount of careful and continued investigation, and one must be impressed by the enormous amount of difficult work involved in gathering the data presented.

It is something of a surprise to know that the Netherlands presents such a serious malarial problem. It lies far to the north and even though it is low and full of canals, one would naturally think of malaria as only an occasional importation

as it is in most of our northern latitudes. But the authors show that special development and adaptation of a short-winged anopheles mosquito is such that the malarial parasites remain active after the sexual activities have subsided and that the mosquitoes are able to convey infections actively until December, by remaining constantly in the homes of the inhabitants and more or less regularly feeding on them. Even though thousands are diverted into stables and feed on live stock there are so many mosquitoes that most houses contain some, hidden away in dark recesses, where they are not easily found. The number seems to be in direct relation to the efficiency of the housekeeper.

Some progress has been made in malaria control, but the authors show how many difficult problems are involved, healthy carriers being being one of the most difficult. Each new addition of territory reclaimed from the sea adds a new focus. It appears that the ditches draining the land are the source of most of the mosquito breeding. The short-winged variety breeds best in water of rather high salinity, while the long-winged anopheles, also abundant, breeds in fresh water but appears not to be a vector of any importance. The authors conclude that satisfactory control will come only at a later time when the canals are so diluted with fresh water that the short winged vectors will be largely eliminated.

A final and instructive chapter is included on the treatment of dementia paralytica with malaria and a description of the careful control exercised, as well as the valuable studies made on the life cycle of malarial parasites in these carefully controlled observations. The material is convincing and will be of value to any one engaged in public health work, but it is by no means limited to this field. Every doctor who comes in contact with malaria will profit by its perusal.

Pathological Technique: A Practical Manual for Workers in Pathological Histology Including Directions for the Performance of Autopsies and for Microphotography. By Frank Burr Mallory, A.M., M.D., S.D., Consulting Pathologist to the Boston City Hospital, Boston, Mass. Cloth. Price, $4.50. Pp. 434, with 14 illustrations. Philadelphia & London: W. B. Saunders Company, 1938.

Little fault can be found with this small work on the methods for staining and handling tissues removed from the body for further study. Everything in the book has been accepted as proper technic in most of the country's major laboratories. This is merely intended to be a compend of accepted practical technics and as such is little concerned with theory or complicated methods. The results to be expected from each stain are listed at the end of each description of method. The descriptions are highly practical, are listed in outline form and are sufficiently complete. The portion on rapid frozen section technic is too brief, since such cursory dismissal does not permit description of modern technic highly useful to the surgical pathologist. However, this volume seems aimed at the postmortem laboratory and as such a fairly complete treatise on necropsy procedure is presented. There are some tables and a brief section on photography, the latter being useless to the professional and a bit too difficult and brief for the amateur. Illustrations are few, an omission painfully noticeable in a laboratory manual. This brief volume describes most of the stains necessary for use in a well equipped laboratory and would make a valuable addition to a pathologist's library.

Die Ernährung der olympischen Kämpfer in Vergangenheit und Gegenwart. Von Adolf Bickel, Professor der pathologischen Physiologie an der Friedrich-Wilhelms-Universität, Berlin. Bücher der Hygiene und Volksernährung, Band III. Herausgegeben von Dr. Max Winckel. Paper. Price, 1 mark. Pp. 36. Berlin: Deutsche Verlagsgesellschaft m. b. H., 1938.

This little book is a lecture delivered by the author on invitation to the Academy of Medicine of Athens, Greece. It is a relatively popular application of part of the thesis of his longer book, The Relation of the Quality of Protein to the Process of Assimilation, published in Basle by Benno Schwabe & Co. in 1938. The book is of primary interest to general physiologists, nutritionists, team physicians and those interested in research in the physiology of exercise. It is of general interest to the sportsman physician. The author has investigated sources, including Gardiner's Greek Athletic Sports and Festivals, for information concerning the type of diet used by the athletes of the ancient Olympic period. He has compared the ancient diet with that of various groups of participants in the 1936 Olympics at Berlin. In view of his observation that the diet consisted primarily of animal and vegetable protein in both groups, the paper inquires into the possible reasons for this emphasis. The work of Zuntz, Loewi, Mueller and Caspari in 1906 indicated that alpine climbers with "arbeitshypertrophie" established indulged their heavy activity using a diet relatively free from protein and composed mostly of the so-called energy foods with no noticeable detrimental physical effects. Attempt is made to rationalize the high protein diet, postulated as the athlete's instinctive choice, on the basis of the increase in oxidation accompanying high protein intake and the rallying of glycogen from known and possibly unproved sources to meet the strain of heavy athletic training and competition. Consideration by tables is given the relative value and oxidizing influence of some forty forms of protein, as well as their possible effects on glycogen availability and storage.

A Text-Book of Dental Histology and Embryology Including Laboratory Directions. By Frederick Bogue Noyes, B.A., D.D.S., Sc.D. Fifth edition revised by Isaac Schour, B.S., D.D.S., M.S., Professor of Histology and Head of Department, University of Illinois College of Dentistry, and Harold Judd Noyes, B.S., D.D.S., M.D. Cloth. Price, $6.50. Pp. 445, with 284 illustrations and 15 plates. Philadelphia: Lea & Febiger, 1938.

For twenty-five years this eminently practical textbook has served as an introduction to dental training, covering as it does a much wider field than the title indicates. This edition reflects the newer ideals and standards of scientific dentistry. When one considers the chapters on the postnatal development of the head, the lymphatic system and tooth eruption and the discussions of comparative and experimental anatomy, the book is really a work on the biology of the teeth. The developing tooth, with its rapid, regular growth and its immediate response to certain changes in the blood, is becoming a veritable growth kymograph, and this type of book commands a general scientific audience (even though the chapter on operative dentistry is likely to set the layman's teeth on edge). Dr. Schour has reorganized the material and has added much that is new. Pathologic conditions, especially caries, are included, as well as normal structure, but the emphasis is kept on the physiologic interpretation of minute structure. The introductory chapters on embryology are followed by descriptions of the histogenesis and definitive structure of the various dental tissues. Here the "histophysiologic remarks" are provocative and stimulating. Thus (p. 113) one reads: "Enamel automatically records in its structure its own stages of formation and calcification as well as its response to systemic disturbances. These records remain permanent after the enamel has completed its formation and calcification and has lost the kymographic properties of its growing period." The new chapter on gums and gingivae is excellent. There are an appended laboratory outline and a good index.

Beitrag zur Kenntnis sklerosierender Entmarkungsprozesse im Gehirn, mit besonderer Berücksichtigung der diffusen Sklerose (Strümpell-Heubner): Eine klinisch-anatomische Studie. Von Lárus Einarson, Professor anatomiae an der Universität Aarhus, und Axel V. Neel, Privatdozent Psych. Laboratorium d. Universität Kopenhagen. Acta Jutlandica, Aarsskrift for Aarhus Universitet X,2. Paper. Price, 7 kroner. Pp. 160, with 72 illustrations. Copenhagen: Einar Munksgaard; Leipzig: Georg Thieme, 1938.

This monograph is based on a careful clinical and microscopic study of six new cases of demyelinizing lesions of the brain. In four of these cases the condition belonged to the class of the Strümpell-Heubner diffuse scleroses and in the other two it was difficult to classify. On the basis of this study the authors come to a new classification of the demyelinizing diseases and attempt to interpret cases reported in the literature in the light of their new conception. They distinguish five types: (1) the blastomatous reactive form, (2) the exogenous inflammatory form, (3) the nonfamilial degenerative form, (4) the heredodegenerative familial form and (5) the peculiar concentric sclerosis of Baló. They propose as a generic term for all these lesions "leukoencephalopathia scleroticans diffusa." Their classification is based on the microscopic appearances, and they believe that with all these lesions many and varied etiologic factors play a part simultaneously. The monograph is well illustrated and has an extensive bibliography. It will be useful to any neuropathologist interested in this interesting group of pathologic conditions.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Medical Practice Acts: Use of Drugs or Operative Surgery by Osteopath Unlawful.—Frankowsky, an osteopath, was licensed in Illinois to treat human ailments without the use of drugs or operative surgery. He was convicted of practicing medicine by the use of drugs, medicines or operative surgery and appealed to the Supreme Court of Illinois.

The medical practice act of Illinois provides for the issuance of three kinds of licenses: (1) to practice medicine in all its branches; (2) to treat human ailments without the use of drugs or medicines and without operative surgery, and (3) to practice midwifery. Frankowsky contended that the act was unconstitutional because its classification of practitioners was false, arbitrary, discriminatory and unscientific. He further argued that the practice of osteopathy includes the use of operative surgery, antiseptics and anesthetics but that, under the act, he could not be licensed to practice osteopathy according to its tenets, including surgery, unless he also studied the use of drugs and medicines in which he did not believe. But, the Supreme Court pointed out, the constitutionality of the medical practice act had been repeatedly upheld. In *People* v. *Witte*, 315 Ill. 282, 146 N. E. 178, 37 A. L. R. 672, the court specifically upheld the reasonableness of the division of all practitioners who seek to cure human maladies into two classes, one class consisting of those having the right to practice medicine in all its branches, including operative surgery, and the other class consisting of those who seek to treat human ailments without the use of medicines or operative surgery. Such a classification is based on a difference in attainments and not on any named method or school of healing. The legislature was not bound to enact a statute which provided for the licensing of applicants from the various schools of healing by creating a separate class for each school with distinct qualifications. The limitations laid down in the statute are voluntary; if an applicant who believes in curing human ailments without the use of drugs or surgery desires to use either, he may qualify himself by meeting the requirements of the statute for a license to practice medicine in all its branches. Frankowsky's contention that he was discriminated against because, in order to practice surgery, the act required him to take instruction in the use of drugs and medicines when he did not believe in their use was answered in the Witte case as follows:

> The practice of surgery requires the use of antiseptics, anaesthetics, and other drugs and medicines. Hence the Legislature required instruction in drugs and medicines as a necessary qualification to enable a physician to perform a surgical operation. In its judgment, no person ought to be permitted to practice surgery without showing a knowledge of drugs and medicines.

Because in the judgment of the Supreme Court no new ground of attack on the constitutionality of the medical practice act had been made, it refused to assume jurisdiction in the case and transferred it to the appellate court of Illinois, first district, second division. In a memorandum decision, the appellate court affirmed the judgment of conviction.—*People v. Frankowsky (Ill.), 13 N. E. (2) 178; 15 N. E. (2d) 894.*

Medical Practice Acts: Chiropractic as the Practice of Medicine.—Three chiropractors were convicted of violating the medical practice act of Texas. They appealed to the court of criminal appeals, which in each case held that the complaint was sufficient and that the evidence justified the judgment of conviction.

In the Hoy case, the defendant was charged with maintaining an office where he offered to treat human beings for diseases and disorders; that he held himself out as capable of effecting a cure thereof without having first registered a license to practice medicine in the office of the clerk of the district court, as required by law, and that on a certain day he treated a named person for a disease and disorder and charged money therefor. At the trial, the patient named in the information testified that he consulted the defendant relative to a physical or nervous ailment, that the defendant, after informing him that he had "misplacements of the vertebrae," gave him no medicine or performed no surgical operation but undertook manually to adjust his vertebrae, and that he paid the defendant $50 for a series of such adjustments. It was further shown that Hoy had not registered any license in the office of the district clerk. The defendant complained that the trial court erred in refusing to sustain challenges for cause which he had interposed with respect to certain jurors who had served previously on juries which had convicted defendants charged with violating the medical practice act. If it had been shown to the trial court, said the appellate court, that the facts in the present case were the same as or similar to those adduced on the trial of the preceding cases, then the challenge for cause should have been sustained. In the absence of any such showing, the trial court correctly overruled the challenge, the challenged jurors having stated that their prior jury service would not affect their opinion or conclusion in the pending case, that they knew none of the facts in the case and that they were not prejudiced against the defendant.

In the Ehrke case, the evidence showed that the defendant maintained an office where he pursued his occupation as a chiropractor and that on a certain day he treated a named patient for nervousness for which he received compensation and that he had not registered a license in the office of the clerk of the district court. An indictment or information, said the court of criminal appeals, for practicing medicine without a license is sufficient if it substantially follows the language of the statute. Furthermore, it is well settled that chiropractors who make adjustments for compensation come within the purview of the medical practice act and must comply with the requirements of that act in order to be entitled to practice.

In the Lanford case, the defendant admitted that he had lived in Brownwood for six years and had been a chiropractor all that time. The evidence showed that he visited a named patient and gave him "a little adjustment and rubbed his jaw —and the back of his neck." The defendant admitted making the visit and that he received $2 as a fee. This evidence was held sufficient to sustain the conviction.

Having found no error in the records, the judgments of conviction were affirmed.—*Hoy v. State (Texas), 115 S. W. (2d) 629; Ehrke v. State (Texas), 115 S. W. (2d) 631; Lanford v. State (Texas), 115 S. W. (2d) 632.*

Workmen's Compensation Acts: Cecitis and Appendicitis Attributed to Trauma.—The deceased was a woman aged 19 who had apparently been in good health. On April 20, in the course of her employment, she slipped, it was claimed, from a stool on which she was standing and struck her right side against the sharp edge of a metal table. No one saw her fall, but within ten or fifteen minutes after the alleged injury she informed a fellow worker that she had been injured in the manner stated, and during that interval a Mr. Crowley saw her sitting on a stool with her hand pressed tightly against her right side. When she reached home shortly afterward her mother observed a swollen and bruised area on her right side. The published report does not make clear what her condition was between that time and May 9, on which day her appendix was removed. At the operation the cecum and the appendix were found inflamed, but there was no perforation. Peritonitis and pneumonia developed and death followed May 15. The claimant, the guardian of the minor child of the deceased, claimed compensation under the Michigan workmen's compensation act. The department of labor and industry awarded compensation. The employer and its insurance carrier appealed to the Supreme Court of Michigan.

Basing its finding solely on the testimony of the physician who performed the appendectomy, the department of labor and industry held in effect that the accidental injury complained of was the proximate cause of death in that it aggravated or produced the appendicitis and that the peritonitis and pneumonia that caused death resulted from the operation to remove the appendix. It would be difficult to determine, the physician had testified, whether the inflammation and infection of the cecum

and appendix were "due to injury or due to some other inflammation," but in his opinion the cecum became infected because the devitalization of the tissue by the trauma enabled infection to set in more easily. He testified further that the probabilities of the cecum becoming infected to the extent that it was from anything other than injury were very slight; that the infection spread from the cecum to the appendix because inflammation in the cecum tends to travel downward, and as the cecum is a blind pouch the "pus or infection" tends to accumulate there and pass on down into the appendix, and that the immediate cause of the death of the deceased was the peritonitis and pneumonia that resulted from the infection and inflammation. Under the circumstances, the Supreme Court could not agree with the contention of the employer and its insurer that the testimony of this physician was incompetent and inadmissible, because his conclusions were based on facts which were not supported by the evidence and because, while it was permissible for him to express an opinion, it was not permissible for him to give his conclusions. The court pointed out that, although the witness did announce his conclusions, he also expressed his opinion that the injury was the cause of the condition which he found.

The finding of the department of labor and industry, said the Supreme Court, that the deceased had sustained an accidental injury arising out of and in the course of her employment was supported by sufficient evidence. The testimony of her fellow worker as to what the deceased told her concerning the injury was admissible as a part of the res gestae and so came within an exception to the rule that hearsay evidence is inadmissible. Furthermore, the statement of the deceased as to her injury was substantiated by the testimony of her mother and of Mr. Crowley as to what they observed shortly after the injury.

The award in favor of the claimant was affirmed.—*Froman v. Banquet Barbecue, Inc. (Mich.), 278 N. W. 758.*

Society Proceedings

COMING MEETINGS

American Medical Association, St. Louis, May 15-19. Dr. Olin West, 535 North Dearborn St., Chicago, Secretary.

American Academy of Tuberculosis Physicians, St. Louis, May 13-14. Dr. Arnold Minnig, 638 Metropolitan Bldg., Denver, Secretary.

American Association for the Study of Goiter, Cincinnati, May 22-24. Dr. W. Blair Mosser, 133 Biddle St., Kane, Pa., Secretary.

American Association for Traumatic Surgery, Hot Springs, Va., May 8-9. Dr. Ralph G. Carothers, 409 Broadway, Cincinnati, Secretary.

American Association of Genito-Urinary Surgeons, Williamsburg, Va., May 24-26. Dr. Charles C. Higgins, 2050 East 93d St., Cleveland, Secretary.

American Association of Industrial Physicians and Surgeons, Cleveland, June 5-8. Dr. V. S. Cheney, Armour and Company, Union Stock Yards, Chicago, Secretary.

American Association of the History of Medicine, Atlantic City, N. J., April 30-May 1. Dr. Henry E. Sigerist, 1900 Monument St., Baltimore, Secretary.

American Association on Mental Deficiency, Chicago, May 3-6. Dr. E. Arthur Whitney, Washington Road, Elwyn, Pa., Secretary.

American Bronchoscopic Society, Rye, N. Y., May 26. Dr. Lyman Richards, 319 Longwood Ave., Boston, Secretary.

American Dermatological Association, Montebello, Canada, May 31-June 3. Dr. Fred D. Weidman, University of Pennsylvania Medical Laboratories, Philadelphia, Secretary.

American Gastro-Enterological Association, Atlantic City, N. J., May 1-2. Dr. Russell S. Boles, 1901 Walnut St., Philadelphia, Secretary.

American Gynecological Society, White Sulphur Springs, W. Va., May 22-24. Dr. Richard W. TeLinde, 11 East Chase St., Baltimore, Secretary.

American Heart Association, St. Louis, May 12-13. Dr. Howard B. Sprague, 50 West 50th St., New York, Secretary.

American Laryngological Association, Rye, N. Y., May 24-26. Dr. James A. Babbitt, 1912 Spruce St., Philadelphia, Secretary.

American Laryngological, Rhinological and Otological Society, Chicago, May 10-11. Dr. C. Stewart Nash, 277 Alexander St., Rochester, N. Y., Secretary.

American Medico-Legal Association, Chicago, May 12-13. Dr. Michel Pijoan, 124 Commonwealth Ave., Boston, Secretary.

American Neurological Association, Atlantic City, N. J., June 5-7. Dr. Henry A. Riley, 117 East 72d St., New York, Secretary.

American Ophthalmological Society, Hot Springs, Va., June 5-7. Dr. Eugene M. Blake, 303 Whitney Ave., New Haven, Conn., Secretary.

American Orthopedic Association, Buffalo, N. Y., June 5-8. Dr. Ralph K. Ghormley, 110 Second Ave. S.W., Rochester, Minn., Secretary.

American Otological Society, New York, May 22-23. Dr. Thomas J. Harris, 104 East 40th St., New York, Secretary.

American Pediatric Society, Sky Top, Pa., Apr. 27-29. Dr. Hugh McCulloch, 325 North Euclid Ave., St. Louis, Secretary.

American Physiological Society, Toronto, Canada, Apr. 26-29. Dr. A. C. Ivy, 303 East Chicago Ave., Chicago, Secretary.

American Psychiatric Association, Chicago, May 8-12. Dr. Arthur H. Ruggles, Butler Hospital, Providence, R. I., Secretary.

American Radium Society, St. Louis, May 15-16. Dr. Frederick W. O'Brien, 465 Beacon St., Boston, Secretary.

American Rheumatism Association, St. Louis, May 15. Dr. Loring T. Swaim, 372 Marlborough St., Boston, Secretary.

American Society for Clinical Investigation, Atlantic City, N. J., May 1. Dr. Isaac Starr, University of Pennsylvania Hospital, Philadelphia, Secretary.

American Society for Experimental Pathology, Toronto, Canada, April 26-29. Dr. Paul R. Cannon, Dept. of Pathology, University of Chicago, Chicago, Secretary.

American Society for Pharmacology and Experimental Therapeutics, Toronto, Canada, Apr. 26-29. Dr. G. Philip Grabfield, 319 Longwood Ave., Boston, Secretary.

American Society for the Study of Allergy, St. Louis, May 15-16. Dr. J. Harvey Black, 1405 Medical Arts Bldg., Dallas, Texas, Secretary.

American Society of Biological Chemists, Toronto, Canada, Apr. 26-29. Dr. C. G. King, Univ. of Pittsburgh, Dept. of Chemistry, Pittsburgh, Secretary.

American Society of Clinical Pathologists, St. Louis, May 12-14. Dr. Alfred S. Giordano, 531 N. Main St., South Bend, Ind., Secretary.

American Surgical Association, Hot Springs, Va., May 11-13. Dr. Charles G. Mixter, 319 Longwood Ave., Boston, Secretary.

American Therapeutic Society, St. Louis, May 12-13. Dr. Joseph F. Elward, 1726 Eye St. N.W., Washington, D. C., Secretary.

American Urological Association, White Sulphur Springs, W. Va., May 29-June 1. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.

Arkansas Medical Society, Hot Springs National Park, May 8-10. Dr. W. R. Brooksher, 602 Garrison Ave., Fort Smith, Secretary.

Associated Anesthetists of the United States and Canada, St. Louis, May 15. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary General.

Association for the Study of Internal Secretions, St. Louis, May 13-14. Dr. E. Kost Shelton, 921 Westwood Blvd., Los Angeles, Secretary.

Association of American Physicians, Atlantic City, N. J., May 2-3. Dr. Hugh J. Morgan, Vanderbilt University Hospital, Nashville, Tenn., Secretary.

Association of Military Surgeons of the United States, Washington, D. C., May 8-10. Dr. H. L. Gilchrist, Army Medical Museum, Washington, D. C., Secretary.

California Medical Association, Del Monte, May 1-4. Dr. George H. Kress, 450 Sutter St., San Francisco, Secretary.

Connecticut State Medical Society, New Haven, May 25-26. Dr. Creighton Barker, 258 Church St., New Haven, Secretary.

District of Columbia, Medical Society of the, Washington, April 25-27. Mr. Theodore Wiprud, 1718 M St. N.W., Washington, Executive Secretary.

Federation of American Societies for Experimental Biology, Toronto, Canada, Apr. 26-29. Dr. D. R. Hooker, 19 West Chase St., Baltimore, Secretary.

Florida Medical Association, Daytona Beach, May 1-3. Dr. Shaler Richardson, 111 W. Adams St., Jacksonville, Secretary.

Georgia, Medical Association of, Atlanta, Apr. 25-28. Dr. Edgar D. Shanks, 478 Peachtree St. N.E., Atlanta, Secretary.

Illinois State Medical Society, Rockford, May 2-4. Dr. H. M. Camp, 224 S. Main St., Monmouth, Secretary.

Iowa State Medical Society, Des Moines, Apr. 25-27. Dr. Robert L. Parker, 3510 Sixth Ave., Des Moines, Secretary.

Kansas Medical Society, Topeka, May 1-4. Mr. C. G. Munns, 112 W. 6th St., Topeka, Executive Secretary.

Louisiana State Medical Society, Alexandria, Apr. 24-26. Dr. P. T. Talbot, 1430 Tulane Ave., New Orleans, Secretary.

Maryland, Medical and Chirurgical Faculty of, Baltimore, Apr. 25-26. Dr. Walter Dent Wise, 1211 Cathedral St., Baltimore, Secretary.

Massachusetts Medical Society, Worcester, June 6-8. Dr. Alexander S. Begg, 8 Fenway, Boston, Secretary.

Minnesota State Medical Association, Minneapolis, May 31-June 2. Dr. B. B. Souster, 11 West Summit Ave., St. Paul, Secretary.

Mississippi State Medical Association, Gulfport, May 9-11. Dr. T. M. Dye, McWilliams Bldg., Clarksdale, Secretary.

National Gastroenterological Association, New York, June 1-2. Dr. G. Randolph Manning, 1819 Broadway, New York, Secretary.

Nebraska State Medical Association, Grand Island, May 2-4. Dr. R. B. Adams, 414 Federal Securities Bldg., Lincoln, Secretary.

New Hampshire Medical Society, Manchester, June 8-9. Dr. Carleton R. Metcalf, 5 South State St., Concord, Secretary.

New Jersey, Medical Society of, Atlantic City, June 6-8. Dr. Alfred Stahl, 55 Lincoln Park, Newark, Secretary.

New Mexico Medical Society, Gallup, May 11-13. Dr. L. B. Cohenour, 219 W. Central Ave., Albuquerque, Secretary.

New York, Medical Society of the State of, Syracuse, April 24-27. Dr. Peter Irving, 2 East 103d St., New York, Secretary.

New York State Association of Public Health Laboratories, Valhalla, May 8. Miss Mary B. Kirkbride, New Scotland Ave., Albany, Secretary.

North Carolina, Medical Society of the State of, Cruise to Bermuda, May 9-14. Dr. T. W. M. Long, Roanoke Rapids, Secretary.

North Dakota State Medical Association, Fargo, May 8-10. Dr. Albert W. Skelsey, 20½ North Broadway, Fargo, Secretary.

Ohio State Medical Association, Toledo, May 3-4. Mr. C. S. Nelson, 79 E. State St., Columbus, Executive Secretary.

Oklahoma State Medical Association, Oklahoma City, May 1-3. Dr. L. S. Willour, Third and Seminole, McAlester, Secretary.

Rhode Island Medical Society, Providence, June 7-8. Dr. Guy W. Wells, 124 Waterman St., Providence, Secretary.

Society for the Study of Asthma and Allied Conditions, Atlantic City, N. J., Apr. 29. Dr. W. C. Spain, 116 E. 53d St., New York, Secretary.

Society of Surgeons of New Jersey, Elizabeth, May 31. Dr. Walter B. Mount, 21 Plymouth St., Montclair, Secretary.

South Dakota State Medical Association, Aberdeen, Apr. 24-26. Dr. Clarence E. Sherwood, Madison, Secretary.

Texas, State Medical Association of, San Antonio, May 8-11. Dr. Holman Taylor, 1404 West El Paso St., Fort Worth, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to members of the Association and to individual subscribers in continental United States and Canada for a period of three days. Three journals may be borrowed at a time. Periodicals are available from 1929 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 18 cents if three periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

17: 1-130 (Jan.) 1939

Cyanosis in Mitral Stenosis. P. Cossio and I. Berconsky, Buenos Aires, Argentina.—p. 1.

*Coronary Artery Disease Analyzed Post Mortem, with Special Reference to Influence of Economic Status and Sex. W. H. Gordon, E. F. Bland and P. D. White, Boston.—p. 10.

*Isolation of Nicotine from Human Urine. O. M. Helmer, K. G. Kohlstaedt and I. H. Page, Indianapolis.—p. 15.

Tissue Pressure: Objective Method of Following Skin Changes in Scleroderma. W. A. Sodeman and G. E. Burch, New Orleans.—p. 21.

Postphlebitic Varicose Ulcer: Surgical Treatment, with Special Reference to the Communicating Veins of the Lower Leg. R. R. Linton and J. K. Keeley, Boston.—p. 27.

Intracranial Vascular Lesions. W. M. Craig, Rochester, Minn.—p. 40.

Effect of Mediastinal Lesions on Pressures in Antecubital and Femoral Veins: Report of Fifty-Two Cases. H. H. Hussey, Washington, D. C.—p. 57.

Bilateral Carotid Sinus Denervation in a Patient Having Syncopal Attacks and a Congenital Vascular Anomaly: Report of Unusual Case. A. H. Elliot, N. T. Ussher and C. S. Stone, Santa Barbara, Calif.—p. 69.

Thrombophlebitis Migrans: Case Report. L. Hirschhorn, J. R. Lisa and R. J. Goldstein, New York.—p. 76.

Ventricular Extrasystoles Induced by Electrical Stimulation of the Exposed Human Heart Rotated 30 Degrees Counterclockwise on Its Vertical Axis. C. J. Lundy, I. Treiger and R. Davison, Chicago.—p. 85.

Study of Transverse Diameter of the Heart Silhouette with Prediction Table Based on the Teleoroentgenogram. H. E. Ungerleider and C. P. Clark, New York.—p. 92.

Coronary Artery Disease.—Gordon and his co-workers tried to determine the influence of the "economic status" on the general incidence and distribution of coronary artery disease. They examined the postmortem records of 600 economically well-to-do patients and for comparison 2,800 patients from the public wards of hospitals. The incidence and degree of significant coronary artery disease occurring in these two groups were determined. The public ward patients came largely from the low middle class of wage earners, many of whom were able to pay in part for their hospitalization. The data show that after the age of 70 years there is no difference in the incidence of coronary artery disease in men and women. Before that age there was much more in men than in women. The disproportion was most pronounced in young adults, the approximate ratio was three young men to one woman. This unequal incidence was evident in both coronary disease and complete occlusion. The relative incidence and the degree of coronary atherosclerosis were found to be significantly greater in the 600 private patients than in the 2,800 general ward patients. The greatest difference occurred in the middle-aged patients, in whom coronary occlusion was found to be twice as frequent in the private group. This difference was most striking in middle-aged men. These observations are in general agreement with clinical impressions.

Nicotine in Human Urine.—Helmer and his colleagues isolated nicotine, as crystalline oxalate and picrate, from the urine of persons who smoke. Its pharmacologic properties are the same as those of pure nicotine. They found that most of the nicotine disappears from the urine within three to four days after smoking is discontinued. Nicotine appears to be the substance responsible for the marked pressor action of many specimens of urine. Unless tobacco has been eliminated as a source of pressor substance in urine, conclusions relating urinary pressor substances to arterial disease are not justifiable. It has been suggested that nicotine might be retained by the body when there is a decrease in renal function.

Annals of Internal Medicine, Lancaster, Pa.

12: 907-1174 (Jan.) 1939

Experimental Heart Disease. G. E. Hall, Toronto.—p. 907.

*Pneumococcic Lobar Pneumonia: Report of 245 Cases, with Special Reference to Specific Serum Therapy. B. Horn, Bridgeport, Conn.—p. 922.

Urinary Diastase in Acute Pancreatic Necrosis: Experimental Investigation. C. J. Smyth, Ann Arbor, Mich.—p. 932.

Effect and Rate of Removal of Pyruvic Acid Administered to Normal Persons and to Patients With and Without "Vitamin B Deficiency." R. W. Wilkins, Soma Weiss and F. H. L. Taylor, Boston.—p. 938.

Acute Disseminated Lupus Erythematosus, a Systemic Disease. E. Rose and D. M. Pillsbury, Philadelphia.—p. 951.

The Aging Process: A Medical-Social Problem. G. M. Piersol and E. L. Bortz, Philadelphia.—p. 964.

*Clinical Study of Malignant Hypertension. I. H. Page, New York.—p. 978.

The Problem of Rheumatism and Arthritis: Review of American and English Literature for 1937 (Fifth Rheumatism Review). P. S. Hench, Rochester, Minn.; W. Bauer, Boston; M. H. Dawson, New York; F. Hall, Boston; W. P. Holbrook, Tucson, Ariz., and J. A. Key, St. Louis.—p. 1005.

Pneumococcic Lobar Pneumonia.—In two and a half years Horn states that 245 cases of lobar pneumonia were encountered. Of these 164 were of type I, II, V, VII, VIII or XIV pneumococcus pneumonia, for each of which specific serum is available. There were 104 type I cases, eighty-four of which were treated with serum, with a mortality of 3.6 per cent. This was in contrast to a 10 per cent fatality in the type I cases not treated with serum. Of thirty-three cases of types V, VII, VIII and XIV pneumonia treated with specific serum the mortality was 3 per cent compared to 12.5 per cent in the non-serum treated cases. Only three cases of type II pneumococcus pneumonia were observed. Serum was given and prompt crisis occurred, with recovery. In the total of 120 serum treated cases the death rate was 3.3 per cent while in the 125 non-serum treated cases the mortality was 16.8 per cent. Serum sickness was observed in only twelve cases. Cutaneous and eye tests for sensitivity can reduce serious serum complications to a negligible minimum. From his experience the author believes that type I serum should be given as early as possible and in large amounts, no matter how late the patient is seen. Also all patients having pneumonia of the types for which therapeutic serum is available should be given the benefits of specific serum therapy.

Malignant Hypertension.—Page states that the diagnosis of malignant hypertension was made in thirty cases when the following morbid changes were observed: (1) hemorrhage and papilledema in the eyegrounds, (2) normal or moderately reduced renal efficiency (unless the disease was of relatively long duration), (3) rapid advance of the morbid changes, (4) elevated arterial pressure often with immoderately high diastolic pressure and (5) normal or slightly reduced plasma proteins and hemoglobin. Malignant hypertension appears to be a syndrome of varied origin. Both men and women suffer from it, men more often. It is a disease of early middle age but may occur in youth or late middle age, seldom in old age. As a rule, hypertensive-vascular disease in the family is not common. It is not unusual for these patients to have had scarlet fever. The chief complaints are headaches, visual disturbances and fatigue. Far less frequent are dyspnea, convulsions, fainting, weakness, precordial discomfort and edema of the ankles. As a rule striking contrast exists between the neurotic behavior of patients with essential hypertension and equable emotions of those with malignant hypertension. The kidneys produce few symptoms. Nausea and vomiting occur often. Severe loss of weight is common. The simultaneous occurrence of these symptoms and signs bode ill for the patient's life. Impressive both to patient and physician is the sudden occurrence of blindness in one eye due to hemorrhage. The results of physical examination usually convince one that the syndrome is rapidly progressive and bears little resemblance to the chronicity of essential hypertension. The heart may not have time to hypertrophy, but dilatation of marked degree is not unusual. Laboratory examination discloses that the heart is seriously injured. This is shown especially by inversion of the T waves in leads 1 and 2. The function of the kidneys may be only moderately impaired until within weeks or months of death, at least as measured by urea clearance or the maximal ability to concentrate urine. More than the normal number of erythrocytes

is found in the urine, indicating that the renal blood vessels have not escaped morbid changes. Hemoglobin in the blood is normal or moderately diminished in the early stages. During the terminal phase it may be sharply reduced. These changes resemble those of chronic nephritis rather than those of essential hypertension.

Annals of Surgery, Philadelphia

109: 161-320 (Feb.) 1939

Variation in the Cholesterol, Bile Pigment and Calcium Salts Contents of Gallstones Formed in Gallbladder and in Bile Ducts with the Degree of Associated Obstruction. D. B. Phemister, H. G. Aronsohn and R. Pepinsky, Chicago.—p. 161.
Further Evidence That Pancreatic Juice Reflux May Be Etiologic Factor in Gallbladder Disease. J. A. Wolfer, Chicago.—p. 187.
Study of Results of Surgical Treatment of Peptic Ulcer. F. B. St. John, H. D. Harvey, J. A. Gius and E. N. Goodman, New York.—p. 193.
Carcinoma of Peripapillary Portion of Duodenum. M. M. Lieber, Philadelphia; H. L. Stewart, Boston, and H. Lund, Uniontown, Pa.—p. 219.
Neurofibrosarcoma of the Small Bowel: Report of Two Cases. A. J. Miller and L. W. Frank, Louisville, Ky.—p. 246.
Dilatation of the Colon: Report of Case Following Development of Aortic Aneurysm; Relieved by Dilatation of Anal Sphincters. H. J. Shelley, New York.—p. 257.
Celiac Ganglionectomy and Plexus Resection for Tabetic Gastric Crises. F. L. Pearl, San Francisco.—p. 263.
Bilateral and Unilateral Renal Agenesis. H. M. Soloway, Chicago.—p. 267.
Dermoid Cyst of the Bladder: Case Report. A. Lidzki, Wilno, Poland.—p. 274.
Cysts of the Urachus: Report of Two Cases. H. I. Kantor, New York.—p. 277.
Whole-Thickness Grafts in Correction of Contractures Due to Burn Scars: Three Case Reports. H. Conway, New York.—p. 286.
*Pilonidal Sinus: Sacrococcygeal Ectodermal Cysts and Sinuses. M. Gage, New Orleans.—p. 291.
*Gas Gangrene Following Therapeutic Injections. C. H. Harney, Philadelphia.—p. 304.
Effect of Constant Gastric Suction on Acid-Base Equilibrium of the Body. J. M. Sullivan, Madison, Wis.—p. 309.

Pilonidal Sinus.—Gage divides pilonidal sinuses and cysts into four groups: (1) sacrococcygeal dimple and sacrococcygeal dimple sinus, (2) true pilonidal sinus confined to the subcutaneous tissue, (3) true pilonidal sinus extending into the sacral canal and (4) true pilonidal sinuses which are continuous with the subarachnoid space and canal of the spinal cord. He describes a method by which surgical excision and primary suture will give a high percentage of cures and a low incidence of recurrence. After the sinus tract has been defined and stained the operative procedure is as follows: With the patient in the prone position a pillow is placed beneath the pubes, and straps of adhesive tape are applied to the buttocks on either side and fastened to the table. The straps separate the buttocks and act as retractors. In the noninfected type an incision can be made directly into the sinus, the sinus easily dissected from the surrounding tissue with a minimal loss of tissue and the resulting wound closed by suture. However, in the majority of instances secondary sinuses are present and necessitate a more extensive dissection. An elliptic incision is made around the primary opening of the sinus and extends down to the periosteum over the sacrum or sacrococcygeal region. If necessary a probe is introduced from the mouth of the accessory sinus through the tract into the open wound, facilitating the dissection of the secondary sinus tracts. The wound is thoroughly inspected and remnants of the sinus tract are searched for and dissected. All bleeding points are ligated with fine silk and the wound is closed by retention sutures of silk or silkworm gut. After closure of the wound edges a dead space is present at the bottom of the wound. If this dead space is not obliterated a recurrence will take place. Complete apposition of all wound surfaces and obliteration of all dead spaces is secured by pressure over the wound. This pressure must be constant and distributed evenly and is obtained by the use of moistened sea sponges. This pressure dressing is left undisturbed for a period of from ten to twelve days. If it becomes necessary to change the dressing, the sponge pressure must be repeated. The author used the foregoing method in forty-two cases of pilonidal sinus, without a single recurrence. There have been nine cases of cutaneous infection with good healing and in one a deep infection which necessitated wound opening developed, but this healed by open granulation. Strug has used the same method in fifty-four cases, with primary healing of the wound in fifty-two. Streptococcic gangrene of the skin developed in one case and serum accumulated in the wound in the other; this was aspirated three times before healing was completed. There have been no recurrences in his cases.

Gas Gangrene Following Therapeutic Injections.—A total of eighty-six cases of gas gangrene following the injection of medicaments have been reported, one of which is cited by Harney. Seventy-six of the eighty-six cases terminated in death. This figure is in marked contrast to the mortality of 49.7 per cent in 607 collected cases of gas gangrene following various injuries. The sites of injection were stated in fifty-nine of the reported cases and of these fifty-five were in one or both thighs, the buttocks or the abdominal wall. In nearly all cases reported, cultures were taken of the drugs, syringes, needles and solutions. A preparation of caffeine and digitoxin was found by Heuss to contain gas organisms. Nauwerck found gas bacilli in a preparation of caffeine sodium salicylate solution. Semenoff and Anschutz were able to find gas bacilli in cultures from the needles used in their cases. Dimtza found gas bacilli in one syringe, one needle and four files of the type used in breaking glass ampules. In all other instances in which studies were carried out the drugs, solutions, syringes and needles were found to be sterile. The most frequent diseases from which the patients given the injections suffered were pneumonia, typhoid and malaria. In twenty-one cases clinical symptoms of gas gangrene appeared between ten and thirty-six hours following the contaminated injections. The time elapsing between the appearance of the clinical symptoms and death varied from one to seven days in forty-five cases. It is considered highly significant that fifty-five of fifty-nine contaminated injections were given into areas of the body surface which might easily be soiled by fecal material. For this reason these areas should be avoided when giving hypodermic or intramuscular injections. However, if they must be used the skin should be sterilized instead of receiving the perfunctory dab with a sponge which is customary in most hospitals.

Archives of Neurology and Psychiatry, Chicago

41: 223-434 (Feb.) 1939

Variation in Vascularity and Oxidase Content in Different Regions of the Brain of the Cat. A. C. P. Campbell, Boston.—p. 223.
*Studies in Mongolism: II. The Thyroid Gland. C. E. Benda, Wrentham, Mass.—p. 243.
Cerebral Circulation: II. Reaction of Pial Arteries to Increase in Blood Pressure. M. Fog, Copenhagen, Denmark.—p. 260.
Body Build in Schizophrenia, with Special Regard to Age. H. Gray and J. G. Ayres, San Francisco.—p. 269.
Connections of the Pulvinar. J. W. Papez, Ithaca, N. Y.—p. 277.
Syncope, Convulsions and the Unconscious State: Relation to Hyperactive Carotid Sinus Reflex. L. J. Robinson, Palmer, Mass.—p. 290.
Progressive Confusional Syndrome Accompanying Injuries of the Cervical Portion of Spinal Cord. T. J. Putnam, Boston.—p. 298.
Therapeutic Use of Curare and Erythroidine Hydrochloride for Spastic and Dystonic States. M. S. Burman, New York.—p. 307.
Lymphomatoid Diseases Involving the Spinal Epidural Space: Pathologic and Therapeutic Consideration. J. Browder and J. A. de Veer, Brooklyn.—p. 328.
Thomas Willis on Narcolepsy. W. G. Lennox, Boston.—p. 348.
Sudden "Brain Death" in Schizophrenia with Extensive Lesions in Cerebral Cortex. N. Malamud and D. A. Boyd Jr., Ann Arbor, Mich.—p. 352.
Hemiballismus: Clinicopathologic Study. F. P. Moersch and J. W. Kernohan, Rochester, Minn.—p. 365.
Progressive Fall in Protein Content of Cerebrospinal Fluid Withdrawn Above a Tumor of the Cauda Equina: Diagnostic Aid. H. D. Fabing, Cincinnati.—p. 373.
Ketonemia in Cases of Mental Disorders. J. W. Thompson and J. H. Aste-Salazar, Boston.—p. 375.

The Thyroid Gland in Mongolism.—Benda points out that facts seem to indicate that hyperthyroidism during the prenatal period is a cornerstone on which rests the explanation of mongolism. Pathologic study of the thyroid in fourteen cases of mongolism reveals that alterations are invariable. These consist in involutional changes: distention of acini, filled with colloid and composed of low epithelium; folding and confluence of acini; diffusion of colloid in the surrounding spaces; overgrowth of epithelium in thick piles, like an adenomatous growth, without formation of new vesicles; changes in the form and shape of the epithelium; increase in stroma, and degeneration of glandular tissue. The changes seen in mongolism differ from those in myxedema and suggest a temporary stage of hyperfunction or dysfunction. It is not known whether the thyroid in mongoloid infants worked too effectively or too early. It is more probable that the condition results from other

influences which affected the embryo. There may be the influence of the maternal thyroid or some other stimulating factor resulting from unbalance of the maternal endocrine glands. There may be also stimulation through some other endocrine gland in the mongoloid organism itself. The microscopic appearance of the thyroid in mongolism reminds the author of the histologic changes seen in cases of pituitary disease.

Archives of Ophthalmology, Chicago

21: 211-408 (Feb.) 1939

Central Angiospastic Retinopathy. S. R. Gifford and G. Marquardt, Chicago.—p. 211.
Cultivation of Trachomatous Conjunctival Epithelium in Vitro. P. Thygeson, with technical assistance of Nancy Roberts, New York.—p. 229.
Peculiarities of Well Known Ocular Diseases in the Netherland East Indies. A. W. M. Houwer, Batavia, Netherland East Indies.—p. 235.
*Mixed Tumor of Lacrimal Gland. T. E. Sanders, St. Louis.—p. 239.
Evolution of Sucking Disk for Intracapsular Extraction of Cataract. T. J. Dimitry, New Orleans.—p. 261.
Dissociated Monocular Nystagmus with Paresis of Horizontal Ocular Movements. M. B. Bender and E. A. Weinstein, New York.—p. 266.
Pathologic Picture of Retinal Detachment: Survey. B. Samuels, New York.—p. 273.
Nutritional Cataract and Relation of Galactose to Appearance of Senile Suture Line in Rats. R. E. Eckardt and L. V. Johnson, Cleveland.—p. 315.
Automatic Trephine for Glaucoma. A. S. Green and M. I. Green, San Francisco.—p. 328.
Operative Procedure for Glaucoma of Shallow Chamber Type: Multiple Excisions of Root of Iris and Deepening of Anterior Chamber. O. Barkan, San Francisco.—p. 331.
Histologic Changes in Lens Produced by Galactose. S. R. Gifford and J. Bellows, Chicago.—p. 346.
Entity of Muscle Recession: Short Résumé of Its Technic and Principles with New Supplementary Notes and Illustrations. P. C. Jameson, Brooklyn.—p. 362.

Mixed Tumor of Lacrimal Gland.—Sanders discusses the records of twelve proved cases of mixed tumor of the lacrimal gland. Ten of the patients have been followed for more than two years. The presenting symptoms in the twelve cases were essentially those of a slowly growing orbital tumor. The most striking symptom was exophthalmos, for which the patient sought medical advice. In several instances this was first noted by persons other than the patient. Probably the most consistent diagnostic finding was the presence of a palpable mass in the region of the lacrimal gland under the outer half of the superior orbital brim. The earliest ocular complaint was transient, indefinite diplopia. As the mass increased in size this was accompanied by a limitation of movement. In six cases there was marked loss of vision below 3/60 when the patients were first seen, and two patients had moderate loss of vision. The vision of six was normal, but in these cases there was usually subsequent loss as the condition progressed. In the majority of cases the onset was insidious, with a slow but steady progression of symptoms. The patients complained of surprisingly little pain or discomfort. Several had an occasional dull ache in the orbit. The general health of practically all the patients was good. Of eleven cases in which surgical treatment was employed, there was recurrence in ten. One patient refused operation and died in six years with marked local invasion and metastases to the liver, lung and mediastinum. Four of the patients had metastases. Five are dead from intracranial extension due to a marked tendency for bony invasion. Microscopically the growths seem identical with mixed tumors of other locations. The invasive element seems to be the epithelium. The recurrence is probably due to incomplete removal. Pathologically the mixed tumors are probably a definite pathologic entity of dual origin, with the characteristic tendency of the epithelial element to become locally invasive. Irradiation is of little aid and early complete surgical removal is indicated. If there is evidence of bony invasion, a resection of the entire tumor-bearing area is indicated; but, if the invasive tumor is limited to the soft tissues, exenteration may be sufficient.

Arkansas Medical Society Journal, Fort Smith

35: 163-186 (Feb.) 1939

Refraction. L. Gardner, Russellville.—p. 163.
Combined Use of Chemotherapy and Artificial Fever in Treatment of Neurosyphilis. F. M. Adams, Hot Springs National Park.—p. 166.
Pneumococcic Pneumonias and Type Specificity. F. E. Schmidt, Chicago.—p. 170.

Missouri State Medical Assn. Journal, St. Louis

36: 49-98 (Feb.) 1939

The Eye in Congenital Syphilis. J. McLeod, Kansas City.—p. 49.
Early Eruptive Syphilis. T. B. Hall, Kansas City.—p. 53.
The Laboratory as a Guide to Diagnosis and Treatment of Syphilis. G. V. Stryker, St. Louis.—p. 54.
Manifestations of Late Syphilis. J. Grindon Jr., St. Louis.—p. 55.
Use of Fever Therapy in Treatment of Syphilis. A. J. Kotkis, St. Louis.—p. 57.
Syphilis of Bones and Joints. F. A. Jostes and M. B. Roche, St. Louis.—p. 61.
Effect of Therapy on Insulin Requirement in Diabetes. B. Y. Glassberg, St. Louis.—p. 69.
Some Recent Advances in Ophthalmology. C. S. Smith, Springfield.—p. 72.

New Jersey Medical Society Journal, Trenton

36: 69-134 (Feb.) 1939

Recurrent Dislocation of the Shoulder. T. Nicola, Montclair.—p. 73.
Diagnosis and Treatment of Malignant Diseases of the Nose and Nasal Sinuses. L. A. Schall, Boston.—p. 78.
Progress in Ophthalmology. A. Rados, Newark.—p. 81.
Salicylate Poisoning: Report of Case. R. E. Jennings, East Orange.—p. 90.
Management of Missed Abortion: Maternal Welfare Article Number Thirty-Four. S. A. Cosgrove, Jersey City.—p. 92.

New York State Journal of Medicine, New York

39: 191-298 (Feb. 1) 1939

Study of the Distribution of Physicians in New York State. J. S. Lawrence, Albany.—p. 199.
Forensic Neuropsychiatry. M. Keschner, New York.—p. 218.
Pneumonia in the Westchester County (New York) Health District, 1931-1935. E. A. Lane, White Plains.—p. 225.
The Responsibility of the Physician in Preventive Proctology. L. A. Buie, Rochester, Minn.—p. 232.
*Prognosis of Insured Neurotics: Study of 1,000 Disability Insurance Claims. P. G. Denker, New York.—p. 238.
Heart Disease and Pregnancy. R. C. Tilghman, Baltimore.—p. 248.
Outline of Treatment for Syphilis: Methods and Technic Followed in Department of Dermatology of the Vanderbilt Clinic: Part III of a Series. A. B. Cannon, New York.—p. 254.

Prognosis of Insured Neurotic Persons.—Denker followed up 1,000 disability claims in which the diagnosis was psychoneurosis. These claimants were all insured and if totally disabled received varying amounts of money in monthly payments depending on the amount of insurance carried. The disability occurred from one to twenty years after the insurance policy was issued. The diagnosis in all instances was made by a physician and often corroborated by a nerve specialist. In the New York area most of the cases were examined by the author himself. Total disability was recognized only after the insured had been ill for at least three months and to an extent that would prevent him from engaging in any occupation for remuneration or profit. The milder or more transient neurotic disturbances are therefore automatically excluded from this study. The follow-up study was made at least five years and, in many cases, from ten to fifteen years after disability had commenced. The great risk of error in labeling a patient neurotic became apparent early in the study. It was found that 293 cases had been erroneously diagnosed "psychoneurosis," the true nature of the illness manifesting itself in most cases within one year as some organic disorder. The age at onset of the neurosis in the 707 true neurotic persons varied from 19 to 59 years, the average age being 37.2 years. This is in contrast to the slightly higher average age of the erroneously diagnosed group, in which 40.8 years was obtained. It appears that middle age in the male produces the greatest neuroses, possibly because his responsibilities are greatest and his career made or broken at this period. In the female this age incidence is somewhat lower. Of the 707 patients, 384 were men and 323 women. However, only from 12 to 14 per cent of the insurance policies during these years (1915 to 1930) were held by women. Neuroses were therefore from three to four times as frequent among insured women as among insured men, which corresponds with the clinical frequency of neurosis in women. No definite conclusions can be drawn as regards occupation, but there is a definitely high incidence of neurosis among clerical workers, executives, teachers and professional people in contrast to the greatly diminished number among manual workers and housewives. Only forty-five of the 707 truly neurotic patients gave a history of a familial mental taint. There were eighteen male

and four female deaths in the entire series, death being due to various causes. Approximately three fourths of the patients recovered within two years of the onset of their neurosis. A little less than half recovered within the first year. It seems that neurotic persons receiving $200 or more per month, who have been ill for three years, practically never get well. The monthly disability check appears to eliminate the incentive to get out and fight life's struggles and, in addition, it acts as a constant reminder to the highly suggestible, mentally ill patient that he is disabled. It appears that it would be much wiser to pay these claims by some form of lump sum settlement at the end of the first year of disability or sooner.

Ohio State Medical Journal, Columbus

35: 121-240 (Feb.) 1939

Interpretation of Clinical Chemical Procedures. J. H. Talbott, Boston. —p. 137.
Recent Advances in Gynecology. P. K. Champion, Dayton.—p. 147.
Angina Pectoris. J. T. Quirk, Piqua.—p. 151.
Report of Case of Beta Hemolytic Streptococcus Meningitis Treated with Sulfanilamide. W. H. Falor, Akron.—p. 154.
Arsine Poisoning: Report of Two Cases. K. D. Smith and T. E. Rardin, Columbus.—p. 157.
Pancreatic Cysts: Report of Two Cases. R. M. Carmichael, Cincinnati. —p. 160.
Newer Treatment Methods in Schizophrenia. E. A. Baber, Cincinnati.—p. 163.
Symptoms and Physical Findings in Peripheral Arterial Disease. L. N. Atlas, Cleveland.—p. 169.
Hypometabolism and Hypothyroidism. R. M. Watkins, Cleveland.—p. 171.
Management of Chronic Urticaria. J. Forman, Columbus.—p. 175.

Surgery, Gynecology and Obstetrics, Chicago

68: 129-256 (Feb. 1) 1939

*Aseptic Necrosis of Bone: I. Infarction of Bones in Caisson Disease Resulting in Encapsulated and Calcified Areas in Diaphyses and in Arthritis Deformans. S. C. Kahlstrom, Bath, N. Y.; C. C. Burton, Dayton, Ohio, and D. B. Phemister, Chicago.—p. 129.
Early Diagnosis of Cervical Carcinoma. A. Wollner, New York.—p. 147.
Early Phases of Prostatic Hyperplasia. C. L. Deming and C. Neumann, New Haven, Conn.—p. 155.
Anatomy of Pelvic and Urogenital Diaphragms, in Relation to Urethrocele and Cystocele. A. H. Curtis, B. J. Anson and C. B. McVay, Chicago. —p. 161.
Early Surgery in Biliary Disease. E. L. Eliason and J. P. North, Philadelphia.—p. 167.
Obstetric Influences on the Weight Curve of the Newborn. W. C. C. Cole, Detroit.—p. 179.
*Evaluation of Intradermal Test for Pregnancy. Susanne R. Parsons, Santa Barbara, Calif.—p. 187.
*Role of Tuberculosis in Anal Fistula. L. A. Buie, N. D. Smith and R. J. Jackman, Rochester, Minn.—p. 191.
Modified Schoemaker Gastrectomy for Chronic Gastric Ulcer. J. Morley, Manchester, England.—p. 197.
Supracondylar Fracture of the Humerus: Analysis of 330 Cases. I. E. Siris, Brooklyn.—p. 201.
Use of Metycaine for Producing Block Anesthesia of Sacral Nerves. E. B. Tuohy, Rochester, Minn.—p. 222.
Management of the Third and Fourth Stages of Labor: Based on 11,000 Deliveries. M. Leff, New York.—p. 224.
*Fat Necrosis—Granuloma of the Breast. S. F. Livingston and M. Lederer, Brooklyn.—p. 230.
Improved, Radical Technic for Repair of Hydrocele Testis. M. Wolf, New Orleans.—p. 236.
Follow-Up of Hernia Repair. A. B. Longacre, New York.—p. 238.

Aseptic Necrosis of Bone.—Kahlstrom and his co-workers report the results of a clinical and roentgenologic study of four cases of caisson disease with extensive changes in the skeleton. One case came to necropsy and in another a biopsy was performed on the involved head of the femur. Extensive lesions were revealed in diaphyses and in epiphyses of certain bones with changes in the joints. The evidence appears to be conclusive that the primary lesion is an accumulation of nitrogen gas in the bones—intravascular or extravascular—with circulatory interference and a resultant massive aseptic necrosis. In the head of the femur or humerus the necrotic lesions may break down and be invaded and eventually replaced by new bone or fibrous tissue. Invasion of portions of the epiphysis may be followed by calcification and arrested transformation, especially in portions of the epiphysis away from the articular surface. Involvement of the articular cortex and cartilage leads to the slow development of arthritis deformans with or without osteocartilaginous loose bodies. The lesions in the shafts are much more numerous and extensive than in any reported case of bland infarction or aseptic necrosis of bone. The necrosis was of the interior of the diaphysis in all instances. It is difficult to state whether the lesions in the bones produced by the nitrogen gas were the result of nitrogen embolism or of nitrogen accumulation within the medullary cavity and direct compression of blood vessels and other tissues or a combination of the two. Lesions of the soft parts are known to be produced by both methods. Points in favor of nitrogen embolism are that (1) the lesions were frequent (in three cases) in the heads of femurs in which the end arteries are known to be found frequently and (2) the metaphyses of the lower end of the femur and of the upper end of the fibula and both ends of the tibia were affected in some cases while their epiphyses escaped, which would favor embolism of the branches of their nutrient arteries. Points against the embolic theory are (1) the enormous size and symmetrical distribution of the necrotic areas and (2) absence of involvement of the bones of the trunk. In favor of the local pressure on blood vessels and other tissues of nitrogen gas accumulated in the medullary cavities is the limitation of the process to the bones of the extremities. These bones are rich in fatty marrow, while the bones of the trunk which have higher temperatures than the bones of the extremities (Huggins and Blocksom) contain hematopoietic marrow. Since fats and lipoids are known to absorb approximately five times as much nitrogen as other tissues, more nitrogen should be liberated within the bones of the extremities than within the bones of the trunk in caisson disease. The best treatment of any form of necrosing lesion of the head of the femur (including caisson disease necrosis) is prolonged abstinence from weight bearing, thus permitting reorganization of the necrotic area, and if possible replacement by new bone with the avoidance of collapse of the head.

Intradermal Test for Pregnancy.—Parsons found that the intradermal test, according to the results obtained in 100 pregnant women and forty postpartum or known nonpregnant women, gives an unreliable test for pregnancy, since it was inaccurate in both the control group and in the known pregnant group with an error of from 4 to 72 per cent. In the early months of pregnancy, error of as high as 72 per cent was obtained. Age, menstruation, days post partum and duration of pregnancy had little influence on the readings. Follutein was found to react more often both in the pregnant and nonpregnant groups, owing perhaps to a protein reaction rather than to the gonadotropic hormone present. Difficulty was experienced in making the readings, as pigmentation of the skin and degrees of erythema were influencing factors which often left in doubt the classification into which the test should fall. From a review of the 679 cases in which the intradermal skin test was performed, the test has proved entirely unreliable in the hands of the workers who have attempted to repeat the work of Gilfillen and Gregg. There seems to be no choice among the various hormone preparations used; all yield equally unreliable results.

Tuberculosis in Anal Fistula.—In order to clarify, if possible, the controversy regarding tuberculosis as a cause of anal fistula, Buie and his colleagues studied 206 consecutive cases of anorectal fistula. Guinea pigs that received subcutaneous injections and those that received intraperitoneal injections of tissue from eleven patients died within three weeks. This low percentage of failures can probably be accounted for by the fact that a method of attenuation of the colon bacillus was employed. More deaths occurred before this time limit expired in the cases of those guinea pigs injected intraperitoneally than occurred after the time limit. Of the 195 cases (94.7 per cent) studied successfully and completely, tuberculosis was not found in 163 cases. In thirty-two cases, evidence of the presence of tuberculosis was found somewhere in the body. Of this group of thirty-two cases, ten gave evidence of a tuberculous "focus"; that is, seven showed healed or inactive pulmonary tuberculosis, two an active pulmonary lesion and one tuberculosis of the cervical lymph nodes. Inoculation of animals, routine histopathologic studies and subsequent study of numerous sections of tissue did not reveal evidence of tuberculosis in the anorectal fistula. Inoculation of animals gave positive results in twenty-two cases, whereas routine microscopic study of sections from an adjacent piece of fistulous tissue gave positive results in only eight cases. These results approach closely those of other

investigators who have used the same method of studying sections of a similar nature. Of the twenty-two patients who were proved to have a tuberculous fistula, seventeen were shown to have, in addition, a so-called focus of tuberculosis elsewhere in the body. In one of the remaining five cases the organism was demonstrated in sections of tissue taken from the fistula. In the twenty-two cases in which positive results were obtained, the average time required for healing was seventy-three days as compared with an average of twenty-nine days in the 173 cases of nontuberculous fistula. Whether a fistula is tuberculous or not should not alter the type of treatment employed.

Fat Necrosis of Breast.—Livingston and Lederer present two cases of fat necrosis of the breast. The first case is particularly instructive because, although it fulfilled all clinical criteria for a diagnosis of a malignant growth, it proved to be a benign lesion. The diagnosis made preoperatively was carcinoma and a radical amputation was performed. In the second case a correct preoperative diagnosis was made and only the lesion was removed. If one was to speculate regarding the cycle of evolution of fat necrosis, it can be said that first either there is trauma from external causes or direct pressure of the breasts from their own weight. If the trauma is severe with injury to blood vessels, one may see areas of ecchymosis. If the trauma extends more deeply there may be no visible evidence of blood extravasation. The presence of pigment in cells suggests that there has been hemorrhage. There is a fat splitting ferment (lipase) in the blood as well as in the fat itself. Fat tissue, being unstable, breaks down easily into its constituents, fatty acids and glycerin. Fat necrosis and fat splitting are two different processes frequently allied, necrosis being the principal event and fat splitting only an accompaniment. The necrosis of fat tissue accompanied by a splitting into fatty acids and glycerin is considered to be a degenerative phase which is closely followed by repair. This repair is characterized by the appearance of spindle, round and giant cells (Menville). Since the majority of fat necrosis is subcutaneous, the fibrous repair tissue acts like strong cords which have no elasticity but have a tendency to retract. Adair states that, early in the cycle of fat necrosis, small cysts may form. After several years these cystic cavities may contain a mixture of small and large calcareous masses. If these tumors are left undisturbed, the contents and wall of the cyst solidify into a calcareous mass. Fat necrosis more closely resembles carcinoma than other benign lesions. The treatment is local excision of the tumorous mass.

United States Naval Med. Bulletin, Washington, D. C.

37: 1-212 (Jan.) 1939. Partial Index

Surgical Shock. H. K. Gray and L. R. Chauncey.—p. 1.
Recent Advances in Endocrinology: Résumé. O. J. Brown.—p. 22.
Recent Advances in the Knowledge of the Vitamins. W. W. Hall.—p. 46.
Sulfanilamide and Chemotherapy: Supplementary Report. R. A. Bell.—p. 73.
Gonorrhea Treated with Sulfanilamide. M. S. Mathis and P. J. McNamara.—p. 114.
Sulfanilamide in Treatment of Gonorrhea Aboard Ship. C. A. Young and J. H. Ward Jr.—p. 129.
*Immune Transfusions in Lymphogranuloma Inguinale. J. P. Brady.—p. 131.
Treatment of Scabies. G. E. Thomas.—p. 137.
Electric Welding, Particularly Eye Hazards and Protective Measures. T. J. Carter.—p. 138.
Time Study of Morbidity and Mortality in the United States Navy. J. M. Wheelis Jr.—p. 142.
The New Policy of Training Naval Flight Surgeons. J. C. Adams.—p. 150.

Immune Transfusions in Venereal Lymphogranuloma.—Brady points out that of sixteen patients with venereal lymphogranuloma given transfusions from immune donors (having had the disease and recovered from it not less than ten weeks before) all showed distinct clinical improvement in mental attitude, color, appetite and definite increase in weight. The disease may be one in which immunity is acquired with formation of immune bodies in the blood stream. The author believes that immune transfusion as a therapeutic agent is worthy of further investigation in this condition and to verify his results. The possibilities of the blood bank are widened if the foregoing results are verified. The naval service offers an excellent opportunity for this study both because of the prevalence of the disease and because of the number of donors obtainable.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

1: 97-146 (Jan. 21) 1939

Thoracolysis: Conservative and Selective Operation for the Treatment of Certain Cases of Pulmonary Tuberculosis. L. O'Shaughnessy and G. Mason.—p. 97.
Critical Review of Extrapleural Pneumothorax. R. Nissen.—p. 100.
Anesthesia in Thoracic Surgery. J. T. Hunter.—p. 102.
*Inguinal Lymph Gland Biopsy in Diagnosis of Tuberculous Disease of Knee. H. J. Seddon.—p. 105.
Electro-Encephalogram in a Case of Pathologic Sleep Due to Hypothalamic Tumor. W. G. Walter, G. M. Griffiths and S. Nevin.—p. 107.
"Sodium Thio-Ethamyl" (Sodium Iso-Amylethylthiobarbiturate). C. L. Hewer.—p. 109.

Inguinal Lymph Gland Biopsy in Tuberculosis of Knee.—Two and a half years ago it was suggested to Seddon (by Fitzgerald) that examination of an inguinal lymph gland on the affected side of a joint suspected of tuberculous infection might give valuable information. For removal of the gland local anesthesia is employed, except in small children. The operation is a biopsy and nothing more. The results in the diagnosis of eighteen cases of tuberculous disease of the knee are given. In a few of these cases inguinal biopsy was not required to establish the diagnosis; since material from the knee was available, however, the author felt justified in removing glands from these patients in order to establish the reliability of the method. There were only three negative results in the series. A positive result is of the greatest possible value, but a negative one cannot be taken to exclude tuberculous disease of the joint. To ensure himself that a positive result could not possibly be fortuitous the author removed glands from other regions in four cases, in none of which was there any evidence of tuberculous disease. Since gland biopsy is a worthwhile procedure, the next step is to apply it in doubtful cases of arthritis of other joints. The merit of the method is its simplicity and safety.

Glasgow Medical Journal

13: 1-56 (Jan.) 1939

Benign Lymphocytic Meningitis. D. A. Cannon.—p. 1.
*Survey of Results of Fractures of Long Bones of the Lower Limb. A. M. Murray.—p. 9.

Fractures of the Lower Limb.—Murray gives the results with fractures of the femur obtained from 1926 to 1935 and of the tibia and fibula from 1932 to 1936 inclusive. Only those cases about which detailed information was available are included in the tabulation of the results. Many of the older patients have died subsequently as the result of other illnesses. Considerable numbers, chiefly of male patients, have been lost sight of owing to the recent migration to England of workers in heavy industries, which in itself presupposes a satisfactory result. The total number of fractures of the femur in males more than 15 years of age was seventy-six. Of these twenty-nine were fractures of the neck of the femur and forty-seven were fractures of the shaft. Nine patients died in the hospital. There were seventy-seven fractures of the femur in females more than 15 years of age. Fifty-four were fractures of the neck and twenty-three were fractures of the shaft of the femur. Eight deaths occurred in the hospital. The total number of fractures of the femur in children up to 15 years of age was seventy-seven, all of which were fractures of the shaft. There were three deaths. There were 214 fractures of the bones of the lower leg: ninety-six in males and fifty-three in females more than 15 years of age and sixty-five in children less than 15 years of age. Only seven deaths occurred in the hospital in this group of patients. Apart from those with immediately fatal results, no patients were subsequently unfit for any occupation. Primary amputation was necessitated owing to damage to the soft tissues and vessels in only two cases. Quite a number of the patients had had both legs broken at the same or different times. When one leg had been operated on and the other treated conservatively the patient maintained that the leg on which the operation was performed was less easily fatigued than the other one. In no case in which operative measures were adopted did nonunion of the bone follow. Since the introduction of stainless steel there has been less reaction in the tissues than formerly. Sepsis following operative treatment of a compound fracture occurred in a few instances but always cleared up quickly leaving no permanent ill

effects. Good results (provided that reduction is efficient) seem to depend to a large extent on (1) the amount of damage to the soft tissue rather than purely bony damage and (2) the patient himself, particularly when he has reached the ambulant stage and is no longer in need of hospitalization. After-treatment appears to be as much a social as a medical problem. The financial aspect is of primary consideration in many cases. Perhaps some arrangement could be made whereby the ambulant patients would be sent out to camps and encouraged to do all sorts of odd jobs and to play games in a modified way until they were fit to return to work. Should they be unfit for their original employment, the onus of finding other work should fall on the former employer. In this way, although the patient would not benefit financially, his incentive to complete recovery would be greater and there would be less scope for the malingerer.

Irish Journal of Medical Science, Dublin

No. 156: 741-788 (Dec.) 1938

Recent Advances in the Surgical Treatment of Pulmonary Tuberculosis. F. J. Henry.—p. 741.
Treatment of Tuberculous Cavities. B. O'Brien.—p. 748.
Leuko-Erythroblastic Anemia: Reports on Three Cases. J. McGrath. —p. 755.
Cardiazol Treatment of Dementia Praecox. H. Bewley.—p. 762.
Geniculate Herpes: Cases. H. L. Parker.—p. 766.
Polycystic Disease of the Liver. T. E. Bradshaw.—p. 768.

Medical Journal of Australia, Sydney

1: 1-48 (Jan. 7) 1939

The Case for Individual Isolation: Its Use in Infectious Diseases and in the Care of Infants. H. J. Sinn.—p. 4.
*Note on a Series of Laboratory Infections with the Rickettsia of Q Fever. F. M. Burnet and M. Freeman.—p. 11.
*Further Series of Laboratory Infections with the Rickettsia of Q Fever. D. J. W. Smith, H. E. Brown and E. H. Derrick.—p. 13.
Rickettsia Burneti: Cause of Q Fever. E. H. Derrick.—p. 14.
Theories of Shock and Their Relation to Burns. J. B. Devine.—p. 14.

Infections with Rickettsia of Q Fever.—Burnet and Freeman describe a series of mild or subclinical laboratory infections with Q fever. The infections were recognized by serologic tests—rickettsial agglutination and protection tests in mice. A mite, Lyponyssus bacoti Hirst, is suspected of being the responsible vector from experimentally infected mice. The mode of infection has not been definitely determined. Since two of the five laboratory workers infected have never worked with the organism, and one of them has been entirely engaged in clerical work, it is strongly suspected that the infection was carried by some freely moving arthropod vector. Mice have been used as laboratory animals in practically all the work on Q fever, and the human infections must have arisen eventually from these. Two ectoparasites are present in the authors' stock of mice; the common mouse louse, Polyplax serrata, is almost always to be found in small numbers and the blood-sucking mite Lyponyssus bacoti Hirst has appeared at times in large numbers. At other times the stock appears to be free from this parasite. Circumstantial evidence points strongly toward the mite, which moves freely and is known to bite human beings, as the responsible vector; but no experimental evidence of its capacity to transmit infection has been obtained.

Q Fever in Laboratory Workers.—Smith and his associates cite two cases of laboratory infection with Q fever. In each case the Q virus was found in the patient's blood by guinea pig inoculation, and Q agglutinins were demonstrated in the serum during convalescence. The infections were associated with mouse experimentation. While the mite Liponyssus bursa (Berlese) was present at times on the mice and was therefore a potential vector, the authors ascribe the infections to direct contact with infective mouse tissues.

Practitioner, London

142: 1-136 (Jan.) 1939

The Importance of Diet and General Treatment in Dermatology. H. W. Barber.—p. 1.
Psychologic Factors in Skin Diseases. C. H. Rogerson.—p. 17.
Significance and Treatment of Itching. W. N. Goldsmith.—p. 36.
Pyogenic Infections of the Skin. G. H. Percival.—p. 55.
Diagnosis and Treatment of Common New Growths of the Skin. S. Thomson.—p. 67.
The Modern Treatment of Eczema. F. F. Hellier.—p. 80.
Alopecia. J. E. M. Wigley.—p. 89.
Fear. J. R. Rees.—p. 99.
First Aid in Air Raids. C. H. Carlton.—p. 107.
Diet in Health and Disease. XIX. General Principles of Diet in Childhood. B. Rivet.—p. 115.

Presse Médicale, Paris

47: 177-200 (Feb. 4) 1939. Partial Index

*Complex Mechanism of Edema in Patients with Heart Disease. E. Doumer.—p. 183.

Mechanism of Edema in Heart Disease.—Doumer says that the edemas of patients with cardiac disorders are generally attributed to purely mechanical factors. Cardiac insufficiency causes disturbances in the peripheral circulation, which in turn leads to stasis and to venous hypertension. The latter causes excess pressure in the capillary network and, under the influence of this excessive hydrostatic pressure, serous transudation and edema develop. This explains certain edemas of cardiac origin but it does not seem to explain all of them. The edemas seem to be of a more complex nature in patients with aortic defects, with hypertension, with coronary lesions and in those with cardiac insufficiency with normal heart and presenting the aspects of left-sided ventricular insufficiency. It is known that left-sided ventricular insufficiency does not produce peripheral edemas or at least it does not produce them until the secondary insufficiency of the right side of the heart has developed. The edemas which complicate the syndrome of insufficiency of the left ventricle are not hard and they pit readily. Moreover, they are not cyanotic but pale like those of patients with renal disease. The author further discusses the hydropigenous factors of a humoral or tissular type, then the noncardiac edemas of patients with heart disease and finally the cardiac insufficiency that is of edematous origin. He reaches the conclusion that the edemas of patients with heart disease are mechanical edemas only in certain cases and to a certain extent. In the development of edematous infiltration there enter multiple factors, some of which are probably only indirect consequences of the progressive cardiopathy. As long as these factors are incompletely understood it is impossible to draw practical conclusions. Once they have been penetrated, however, it will doubtless be possible to face the problem of the treatment of the edemas as well as of certain conditions of heart failure if it is confirmed that certain hydropigenous conditions may exercise secondarily a harmful action on the function of the myocardium.

Sang, Paris

13: 113-224 (No. 2) 1939

Anemia in Patients with Bright's Disease. M. Loeper and P. Perreau. —p. 113.
Diagnostic Significance of Plasmocytic Tendency in Infectious Mononucleosis. R. Waitz.—p. 131.
*Clinical Value of Coaguloretractovisometry in Internal Diseases. L. Blacher.—p. 140.

Coaguloretractovisometry in Internal Diseases.—Blacher says that he has employed his own method of coaguloretractovisometry on the blood of 147 patients. Describing this method in a previous report, he differentiates between "the reaction of coagulability" (coagulation of the upper layer of the blood) and "the reaction of coagulation" (coagulation of the lower portion of the blood). Moreover, he distinguishes between the "time of the reaction of coagulability" (the time elapsed from the mixture with the reagent to the moment of appearance of coagulation) and the "time of the reaction of coagulation" (interval required for the coagulation of the remaining blood). In the present report he finds that the variations of the coagulability of the blood, which are ascertained in diverse internal diseases, are typical for each particular disorder. Not only are the quantity, quality and amplitude of the deviations of the evolution of the coagulability characteristic for the more or less grave forms of the hemorrhagic conditions, but they reveal the nature of the pathogenic agent and the length of time it has been active. In morbid states there are observable modifications not only of the reactions of coagulability but also of the structure of the clots. According to their physical properties, the clots can be classed as hard, soft, liquid and "sanguinolent." The marbling of the clotted blood, which the author observed most frequently in cases of hemorrhagic disturbances of the hepatosplenic system, indicates the absence of the reaction of retractility in the clotted blood. The variations in the course of the coagulability of the blood in the hypochromic anemias indicate either impending hemorrhage or occult bleeding. In pernicious anemia, liver treatment exerts

a perceptible action on the retractility of the coagulated blood, particularly the retractive force of the clot. The oscillations of the phase of coagulability do not depend on the evolution of the reaction of retractility and on its force; on the contrary, the retractive force of the coagulum depends most often on the evolution of the reaction of retractility of the clotted blood. The peculiarity of the detected traits in the coagulability in the course of diverse diseases procures for each of these diseases a new pathognomonic symptom, which may be helpful both in the diagnosis and in the prognosis. The variations in the coagulability of the blood are directly related to the condition of the liver and of the spleen. The spleen exerts an inhibiting effect on the course of the coagulation and especially on the reaction of the retractility of the clot. The liver is the principal producer of the substances that are necessary for the process of coagulability, whereas the spleen regulates the process. The variations of the course of the reactions of the coagulability of the blood are concomitant to the corresponding oscillations in all the corpuscular system of the peripheral blood. The strongest modifications of this phenomenon have been revealed in the course of a thrombopenia with a thrombocytic formula "deviation to the right" without acrochromatic or achromatic platelets.

Anales del Inst. Modelo de Clin. Médica, Buenos Aires

18: 1-688 (No. 1) 1937. Partial Index

Alteration of Esophageal Mucosa and Its Folds from Roentgen Point of View. R. S. Abad.—p. 248.
*Perforated Cholecystitis: Anatomoclinical Variations. J. A. Caeiro.—p. 638.

Perforated Cholecystitis. — Caeiro reports six cases of perforation of the gallbladder in the course of calculous cholecystitis. He found that the condition is due to necrosis of the walls of the structure. The clinical and anatomopathologic forms of perforation depend on the type, either acute or benign, of the infection by which the evolution of perforation is controlled and also on the presence or absence of peritoneal adhesions. He observed that acute perforation takes place in gallbladders which contain fluid at great pressure or calculi obstructing the cystic duct. Perforation takes place at the point of greatest pressure or where the calculi are impacted. The gallbladder is not inflamed, although the walls are thickened. There are no adhesions from the structure. Perforation of slow evolution takes place in calculous cholecystitis of long duration. The gallbladders are filled with calculi and there are many adhesions through which the structure is joined with one or several visceral organs. Perforation takes place at the point of greatest pressure of the calculi or at the point of union of the gallbladder with adhesions. Perforation at the lower aspect of the gallbladder is frequently complicated by the formation of fistulas between the gallbladder and the colon and duodenum. That at the upper aspect of the structure is frequently complicated by fistula of the liver. In either case the gallbladder empties its contents into the organ with which it joins, through the fistula. Perforation of the liver is complicated by grave abscess of the liver and degeneration of the liver parenchyma. When perforation is at the lower aspect of the gallbladder there is a history of the patient with grave repeated infection, frequently with jaundice, inflammation or tumors at the subhepatic region, a grave peritoneal reaction and symptoms simulating gastric or duodenal ulcers. When it is at the upper aspect of the gallbladder, pain in the liver and acute hepatitis are the predominant symptoms. An early diagnosis is of importance. The treatment consists of cholecystectomy, at the end of which an ample drainage is left.

Archivos de Pediatria del Uruguay, Montevideo

10: 1-72 (Jan.) 1939. Partial Index

Bacteriology of Nontuberculous Diseases of the Lungs in Children. G. Elkeles.—p. 20.
*Meningo-Encephalitic Complications of Typhoid in Children. E. Peluffo and C. E. Castells.—p. 35.

Meningo-Encephalitic Complications of Typhoid in Children.—According to Peluffo and Castells, typhoid bacteria have a special affinity for the nervous system, especially in children. The most frequent complications of typhoid in children are those involving the meninges or the brain with development of a special type of encephalitis. The acuteness of the complications vary in different cases. Meningitis is more frequent and less grave than the encephalitic complications. It may develop at any time in the course of typhoid. Sometimes the meningeal reactions are the predominant symptoms of typhoid, and again grave suppurative meningitis may develop. The encephalitic complications may cause bulbar, cerebellar ataxic, mesencephalitic, choreic, cortical aphasic, mental and epileptic symptoms. The prognosis of the complications, especially encephalitis, is grave. Until recently symptomatic treatment was resorted to, but satisfactory results have now been reported in the literature in cases of typhoid encephalitis from a treatment with immunotransfusion. The authors report four cases in children between the ages of 3 and 4 years. In none of the patients was immunotransfusion resorted to. Three patients died. The one who recovered has mental sequels.

Zeitschrift für Krebsforschung, Berlin

48: 169-282 (Dec. 17) 1938. Partial Index

Neoplasm of Mamma-like Structure in External Gastric Layers of Rabbit After Prolonged Treatment with Estrogen. Hannah Pierson.—p. 177.
Behavior of Lipoids of Implantation Tumors in Organism of Host. A. Lang and A. Rosenbohm.—p. 183.
*Regeneration of Skin of Mice After Preliminary Treatment with Cancerigenic Substances. Doris Dietrich.—p. 187.
Experiments with Heterotransplantation of Tumor Tissues. H. W. Schmidt.—p. 223.
Photochemistry of Antilytic Factor in Cancer. B. Bugyi.—p. 227.
Primary Tumors of Epididymis. B. Falconer.—p. 243.

Skin After Treatment with Cancerigenic Substances.—In this paper Dietrich reports studies on the part played by regeneration in the pathogenesis of experimental cancer. It was her aim to find answers to the following problems: 1. How does regeneration take place in skin that has been treated with cancerigenic substances? 2. Is it possible to produce cancer earlier in this manner than is possible merely by chemical irritation? 3. Is this production of malignancy due to a latent cancerigenic characteristic of the epithelium which becomes manifest as the result of the stimulus of regeneration, or is an action of the cancer producing substance on the general organism responsible for this special course of regeneration? The author made studies on sixty-six mice which had been treated with cançerigenic substances (tar and benzpyrene). After various periods of time, pieces of skin were removed from the site that had been painted with cancerigenic substances and from another site (posterior portion of the back). The pieces were sectioned and subjected to microscopic examination. The wounds were left open following the excision and after twelve days of regeneration another excision was made at the same sites and these pieces too were examined microscopically. It was found that, depending on the length of painting with the cancerigenic substance, the skin showed thickening of the epidermis with desquamation, formation of cones, papillomas or atypical proliferations. The pieces excised from the unpainted sites never showed changes in the epidermis; that is, they were identical with those from mice that had not been painted with cancerigenic substances. Thus the untreated pieces of skin gave no indication that the painting with cancerigenic substances had caused a general alteration in the organism. In two cases the regeneration on the untreated site showed more pronounced conical formations than is normally the case, but it would be going too far to conclude from this that painting of a site with cancerigenic substances causes general changes in the organism. The site that had been painted with cancerigenic substances showed considerable deviations of regeneration. During a certain stage of the painting with cancerigenic substances the added regeneration stimulates the as yet unchanged epithelium to an increase in layers, to greater cone formation and partly even to proliferation with atypical transformation. It may be said that by the addition of regeneration the epithelium is transformed from a precancerous into a cancerous condition. However, it appears that the proliferating epithelium or the one that has already undergone cancerous degeneration may show normal regeneration. The innate drive of the cell toward

regeneration with the aim of bridging a defect is not changed or inhibited by painting with cancerigenic substances. To be sure, the time required is usually somewhat longer than normal. In the final estimation of these studies in which the author also cites a report by Brunschwig, Tschetter and Bissel on "Wound Healing and Neoplasia," she says that her microscopic studies did throw some light on this relationship between regeneration and cancerigenic action. Her studies indicate that the tendency to proliferation is accelerated by regeneration and that the regeneration is the eliciting factor for proliferation, if an anlage to it existed previously.

Geneeskundig Tijdschr. v. Nederl.-Indië, Batavia

79: 1-64 (Jan. 3) 1939

*Clinical Investigations in Connection with Beriberi: Significance of Edema in Beriberi. F. M. Meyers.—p. 3.
Vitamin C Content of Fruits in the Dutch East Indies. J. P. Spruyt.—p. 17.
Method of Examination in Treatment of Malaria. J. Kuipers.—p. 24.
Noteworthy Case of Snake Bite Poisoning. W. M. G. Helfferich.—p. 40.

Edema in Beriberi.—A deficiency in vitamin B_1 (aneurin) appears under two distinct clinical syndromes: (1) as a simple polyneuritis and (2) as a complex syndrome with polyneuritis, edema and a disturbance in the function of the heart and blood vessels. Studies by Meyers were made to determine the significance of the edema in beriberi. In most cases of simple polyneuritis the appearance of the nervous lesions is preceded by other, usually infectious, processes. This is not the case in beriberi. Moreover, the polyneuritides do not seem to be early forms of beriberi and the transformation of polyneuritis into beriberi seems to be the exception rather than the rule. On the basis of purely anamnestic information it was not possible to discover any difference in the dietetic insufficiency of the two types of patients. Heart disease is also absent in about half of the cases of polyneuritis without edema, and heart disease is present in 92 per cent of the cases of polyneuritis with edema. Yet it is hardly possible to consider the edema in beriberi as only of cardiac origin. The vascular syndrome after an injection of epinephrine which is typical for beriberi (Aalsmeer) is absent in the majority of cases of polyneuritis, and Volhard's diuresis test has a normal course in these cases. Volhard's test may have the same result in beriberi, in which the edema is of a pronounced transient character. These transient edemas represent probably the simplest and purest picture of the edema of beriberi. They are of a hydrostatic nature and seem to be caused by a lowering of the tonus of the arteriolar walls and by an increased tension in the capillary system. The epinephrine blood pressure curve (Aalsmeer) which is typical for beriberi seems to be a manifestation of this. The question why edema exists only in some of the cases of deficiency in vitamin B_1 thus leads to the inquiry after the causes of the circulatory failure. This question has not been answered as yet, but since treatment with aneurin cures the edema as well as the nervous lesions it seems probable that the first has an intrinsic rather than an extrinsic origin.

Norsk Magasin for Lægevidenskapen, Oslo

99: 1289-1384 (Dec.) 1938

Otogenic Encephalitis. T. Leegaard.—p. 1294.
Vitamin B_1 Therapy in Delirium Tremens. J. Kloster.—p. 1301.
*Acute Terminal Ileitis. H. F. Harbitz.—p. 1305.
Spontaneous Rupture of Aorta with Dissecting Aneurysm in Boy Aged 14½. K. Harstad.—p. 1311.
Binasal Hemianopia with Tumor in Posterior Fossa. A. Torkildsen.—p. 1317.
Case of Late Rupture of Ligament of Extensor Pollicis Longus after Fracture of Radius. N. Clemetsen.—p. 1322.
Case of Abdominal Abscess with Unusual Etiology (Salmonella?). O. Hartmann.—p. 1329.
Pyloric Stenosis in Gastritis. C. Schultz.—p. 1333.
*Symptomatology of Mitral Stenosis. O. Jervell and G. Grytting.—p. 1337.
Sulfanilamide in Malaria. W. Loennecken Jr.—p. 1353.
Investigation on Acidity Relation in Chronic Peptic Ulcer Before and After Ulcer Treatment. Ruth Ramberg.—p. 1358.

Acute Terminal Ileitis.—Harbitz reports two cases of acute terminal ileitis in youths aged 15 and 19 respectively. It was characterized by subacute onset, abdominal pain for from eight to ten days and then aggravation with severe pain in the right iliac fossa. On rectal exploration there was tenderness on the right side. There was a marked red thickening of the distal end of the ileum in one case; in the other, palpation of the intestine showed a leathery thickening like that in linitis plastica, but glandular enlargement dominated the picture, in the first case with one gland the size of a walnut and another the size of a pigeon's egg, in the second case with a hard glandular tumor about the size of a hen's egg. Acute terminal ileitis, the author says, may be considered as a distinct entity. Clinically it usually appears as an acute or subacute appendicitis. Although the affected portion of the ileum can hardly be palpated, the pronounced enlargement of the glands should be noticed. The disease occurs most often in the first two decades of life. Treatment should as a rule be exploratory laparotomy and appendectomy. The appendix is usually of fairly normal appearance and a relationship to the inflammation in the ileum is doubtful. The author expects certain roentgenographic changes in the lower part of the ileum seen in his cases some months after the laparotomy in the acute stage, probably as a result of the earlier acute ileitis, to disappear gradually, but continued observation is called for. He wishes to stimulate after-examination in cases of conservatively treated acute terminal ileitis. He adds that chronic terminal ileitis occurs most often in the third and fourth decades of life, usually with the symptoms of a chronic enteritis, and may resemble an ulcerous colitis; chronic diarrhea is most often the first symptom. Infiltrations develop in the lower ileum, with ulcerations, abscesses and perforations. The affected intestinal portion gradually becomes narrowed and a true ileus may occur. In addition to palpation, x-ray examination is of decisive significance. Treatment often consists of the employment of laparotomy with drainage, with later entero-anastomoses and finally resection.

Mitral Stenosis.—Jervell and Grytting studied 169 cases of mitral stenosis (in forty-four men, 125 women) observed during the last five years. In eighty-two (twenty-nine men, fifty-three women) there was history of one or more attacks of rheumatic fever. Fifty-nine (ten men, forty-nine women) had no history of diseases to be connected causatively with the valvular defect; these cases, predominating in women, are thought possibly to depend on a disposition in women to rheumatic infections without clinical symptoms. The rheumatic fever in most cases occurred between the ages of 10 and 20. Most of the patients were between 20 and 40 years of age, forty-four were over 50 and three over 70. The duration in the fourteen patients who died, aged from 24 to 65, was from two to twenty-eight years. Eighty patients had palpitations, which in nineteen were the first symptom. Fifty-eight reported pain in the heart region, fourteen of these typical angina pectoris; in five this symptom led to the diagnosis. When asystolia sets in, dyspnea dominates the picture; 134 had dyspnea during rest or on exertion, and in 121 it was the first symptom. The authors say that mitral stenosis in the first stage may be difficult to diagnose. A presystolic or diastolic murmur is the characteristic auscultatory observation. The diastolic murmur may be loud or soft, short or long continued. A systolic murmur was established in 118 of the 169 cases, clear diastolic murmur in 115, presystolic murmur in thirty and gallop rhythm in twenty-four. In six cases there was no certain murmur and in seven only a systolic murmur. X-ray examination is of great value in the diagnosis of mitral stenosis, electrocardiographic examination being less important. There is distention of the pulmonary artery, right ventricle and left auricle, and signs of pulmonary stasis are often present. "Mitral configuration" appeared in fifty-six cases (73.9 per cent), enlargement of the heart in fifty-four cases (71.1 per cent) and both "mitral configuration" and enlargement in 52.6 per cent. Compensatory hypertrophy of the heart can be anatomically established; dilatation is believed to occur first, and the enlargement of the heart established on x-ray examination is regarded as a dilatation. There was arrhythmia in 102 patients and hypertonia in nineteen, with permanent hypertension of more than 200 in only three. Mitral stenosis is not seldom combined with other valvular defects. If early diagnosis of mitral stenosis is made and the patient's manner of living regulated early, the asystolic stage may be avoided or at all events delayed.

THE STUDENT SECTION

of the

Journal of the American Medical Association

Devoted to the Educational Interests and Welfare of Medical Students, Interns and Residents in Hospitals

SATURDAY, APRIL 22, 1939

The Legal Status of the Intern

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Read before the Thirty-Fifth Annual Congress on Medical Education and Licensure, Chicago, Feb. 14, 1939.

In the last quarter century twenty-one states and Alaska have made the hospital service a requirement for licensure. Some medical schools withhold the degree until one year at least has been served. In 1938 the Council on Medical Education and Hospitals reported for the United States 7,354 internships in 729 approved hospitals and for Canada forty-eight approved hospitals. In addition, clinical clerkships in teaching hospitals, where men have varying types of duties, furnish an opportunity for the student to become familiar with the service in advance of formal appointment. A change has been noted in the place of the intern in the educational scheme. Whereas in the past the service in the hospital was considered postgraduate training and optional with the student, longer training as a resident is now required and the intern is regarded more as an undergraduate, still pursuing his medical course, learning the art as well as the science of medicine. Longer periods of intern service are offered and consequently the assumption of more responsibility for adequate care of the hospital patient. With increased responsibility has come the necessity for wider knowledge, more maturity of judgment and better poise.

When the intern enters the hospital, he learns for the first time in his life that he is liable for his acts not only as an individual member of society but as a professional man. Besides, once the medical student comes in intimate contact with patients he is amenable to the statute governing the practice of medicine in his state. For the first time his every word and every act are scrutinized, often remembered and frequently misunderstood by a person rendered hypercritical by illness. The intern by a thoughtless remark alone can cause a malpractice suit for the physician referring the patient. Observations concerning previous diagnosis and treatment are particularly dangerous, because the patient rarely understands and never correctly describes any medical opinion or procedure.

COSTLY MISTAKES

With improvement in the technic of diagnosis and treatment and the consequent increase in mechanical manipulations, the opportunities for costly mistakes are enormously increased. A broken spinal puncture needle, the silkworm-gut suture left in the abdominal wall, the wrong solution injected into a body cavity, an infection following a trifling operation may cause the intern untold trouble with possibly the loss of reputation in the locality, the loss of money and indirectly great damage to the prestige of the hospital. Thoughtful men in all departments of medicine are disturbed at the way in which litigation is increasing, the ease with which it can be started, the complicated, costly, and to physicians the cumbersome methods of the Law. They are astounded at the ease with which the slightest slip in technic is magnified when presented to a jury of laymen, and the difficulty of getting the truth to prevail. The hospital may protect its property and its employees; the visiting staff can rely on the insurance company to assume liability. Apparently the intern, if attacked as an individual, is without protection. One insurance company in New England, with long experience in this field, offers no way in which the intern may be covered. Another company specializing in liability insurance replies: "Our Hospital Policy covers the liability of a hospital on account of the negligent acts of interns, resident physicians, and medical students. It will not, however, cover the liability of resident physicians, interns or medical students themselves." Insurance companies demand a certain competence, experience, medical society membership and the good opinion of men of the same standing. House officers cannot yet meet these standards. Besides, it appears that if a liability contract were devised the high cost would be a deterrent to many

young men still under expense of education. Until the legal status of the intern is determined by precedents or, better, by statute the hospital can scarcely afford to insure him.

The hospital has a selfish interest in protecting the intern from himself for its own salvation. One can but feel that too often the intern is given too much latitude in the conduct of ward service. No one believes today that an internship prepares any man to become a safe, conservative surgeon. And that often appears to be the aim of the student himself. Some of the dissatisfaction existing in unnecessary and harmful operative work done in private practice springs from the practice of permitting the house surgeon to do by himself operations for which he is not trained.

Many hospitals with a small resident staff require many routine administrative duties and the assumption of altogether too much responsibility in the performance of technical procedures. Hospital administrators complain that the intern is poorly prepared to do his job. But, as Dr. Lucius R. Wilson says, "The intern is suddenly transported from the environment of the medical school he knows so well and finds himself in a new hospital constructed and operated along different lines from the one he knew as a student. The hospital routines are different, its rules and regulations developed from years of experience with its particular problems are hard to understand. The staff have names with which he is unacquainted, he knows little, if anything, of their contribution to medicine; the hospital routines following different channels from those strongly entrenched in his mind."

As has been pointed out by more than one hospital executive, not only is the intern entitled to the conventional precedent book of routine matters but he should be introduced to his new duties by some one who will be a sympathetic adviser, who can interpret to the newcomer methods and customs of that hospital, in which otherwise he may grope and stumble during his whole appointment.

HOSPITALS ARE COMPLEX ORGANISMS

He should be taught that hospitals are complicated organisms, serving in a most personal manner the public made up of all types of individuals, dealing with persons sensitized by illness, with relatives and friends even more demanding and more critical. The opportunities for trouble in the hospital exist in every procedure, every minute of the day, and involve every employee and officer and every physical feature of the plant.

The intern is charged with the duty of carrying out the instructions of the attending physician except in emergency. When an emergency arises it is incumbent on the intern to exercise his own judgment until report can be made to the attending physician.

The intern may be charged with failure to obtain consent for an operation from a husband or the parent of a minor. Care must be used that state laws are observed. Permission should be reviewed by the superintendent's office. He is liable for malpractice in the case of a minor, to the majority of the patient and whatever the statute of limitations may be beyond that; in one state to the age of 23.

In obtaining permission for necropsy the intern must get the signature of the right person, preference being given to the relative who assumes control of the body, bearing in mind that a minor cannot grant permission, though he is the sole survivor. One must be certain that the person granting permission clearly understands the nature of the necropsy and that the scope is definitely established, as well as understood and followed by the pathologist. Where the coroner system prevails one must be careful in doing autopsies on the orders of that officer. Limitations of his power exist and outraged relatives may cause difficulty. Every city has regulations as to what constitutes medicolegal or "medical examiners'" cases, including abortions, prisoners, wounds and deaths from criminal violence. Failure to report such may be serious for the hospital.

The house officer is amenable to the law and held for his acts in privileged communications in the same way as physicians in private practice. He is forbidden to communicate with patients for the purpose of engaging the services of attorneys.[1] He is forbidden to report deaths to or recommend particular undertakers. He may be summoned to court with hospital records and compelled to testify to facts. Interns must respond to subpena, but hospitals may and sometimes do refuse to disclose the names of members of the house staff who have treated patients involved in lawsuits, because much time is lost in attending court. The New York law is so comprehensive that the intern had best avoid all relations with attorneys except as the superintendent of the institution directs.

An intern at a charity hospital referred accident cases which he had solicited to two attorneys. Although he denied an agreement, he fully expected to be paid. He was advised to plead guilty to the charge and was sentenced to three months in the penitentiary (297 N. Y. S. 103[2]). He is subject to the national and state income tax laws. The superintendent of the hospital returns to the tax authority each year the list of employees having a minimum income, with board and living, if furnished, computed at approximately $500 a year.[3]

1. Hayt and Hayt: Legal Aspects of Hospital Practice, New York, 1938, p. 86.
2. Cited by Hayt and Hayt.[1]
3. Hayt and Hayt: Legal Aspects of Hospital Practice, p. 16.

Many hospitals are getting a larger number of personal injury, street accident and compensation cases than ever before. Larger numbers of citizens come within the categories covered by various types of protection. The intern will treat many more of these cases in a short service than the private physician. The hospital should therefore have a clearly defined routine for his guidance, since the payment of the hospital bill and the patient's chances of financial recovery depend so much on prompt and proper reporting.

INTERNS' COUNCILS

The national Wagner act and the little Wagner acts of the states bring the place of the intern as an employee to the serious consideration of hospital authorities. Interns' councils, formed for scientific purposes for the maintenance of standards, should not be the cells for labor agitation. Demands for higher salaries have disturbed thoughtful physicians interested in fostering the spirit of true hippocratic medicine and loyalty to the ideals of the past. Criticism has been heard of breaking of contracts by interns without much consideration for the hospital.

It is unfortunate that social legislation compels the hospital to place the intern in the category of employees. "An employee is one whose duties consist in the rendition of prescribed services and not the accomplishment of specific objects, and whose services are continuous, not occasional or temporary." [4]

For compensation purposes the intern is covered by the law governing employees. Interns and nurses in a hospital maintained by municipal or other political units are also within the compensation law coverage. In a case of voluntary insurance by a charitable trust an intern is also held to be an employee.[1] An intern in the Cook County Hospital contracted epidemic meningitis and died. An award to his widow by the arbitrator was set aside by the industrial commission but it was affirmed by the circuit court and by the Supreme Court of Illinois. "A distinction is drawn between the position of a visiting or consulting physician and that of an intern, who has placed his time and service at the call of a superior. The intern is under a duty to spend his days and nights at the hospital, and to render any service, administrative or medical, exacted by the hospital through its administrative agents, within the range prescribed by propriety and custom. He is a servant or employee by every test of permanence of duty, intimacy of contact, and fulness of subjection." [5] When the Social Security Act is extended to include hospitals, the house officer will doubtless be included in its coverage.

4. Commissioner of Internal Revenue, act of 1928, quoted by Supreme Court of Massachusetts in Mallory v. White, 8 F. Supp. 989.
5. Hayt and Hayt: Legal Aspects of Hospital Practice, p. 178.

LIMITS OF RESPONSIBILITY

No general doctrine exists fixing the limits of responsibility of different types of hospitals and the different classes of persons attached to the hospitals. Court decisions vary from state to state. House officers, along with pathologists and roentgenologists as well as private physicians and special duty nurses, are classed as nonadministrative employees. The general rule is that the hospital is not liable for their negligence. Administrative employees, all those attached to the superintendent's office, for instance, form the other group. Responsibility for their conduct may rest on the hospital, a knotty problem which the courts have considered for years.

The policy of today seems based on the acceptance of the fact that the hospital is not liable for the negligence of its doctors and nurses in any matter included in the patient's "medical care and attention." In some cases in which an operation is performed the intern, as well as the nurses, has been held to be the delegate of the surgeon, to whose orders he is subject. This includes the preparation for the operation. In the alleged performance of an operation without the consent of the patient, this was the opinion of the court. The fact that the house physician acts under the orders of his superior, who is a licensed practitioner, does not relieve him of responsibility. "The surgeon who performs an operation is not responsible for the acts of his assistants and nurses unless they are his own employees." So, the house surgeon who works with him cannot look to the chief for protection.

The doctrine is widely accepted that a hospital is not responsible for the acts of its visiting staff. The hospital undertakes to provide for the patient the services of its house staff. It does not promise to perform these services itself. The charitable hospital is relieved from responsibility for the acts of its employees provided it has not been negligent in its choice of employees. On the other hand, ". . . a hospital conducted for private gain is liable in damages to patients for injuries resulting from negligence of the nurses and employees. A patient is admitted to a hospital conducted for private gain under either an express or implied obligation that he receive such reasonable care and attention for his safety as his mental and physical condition, if known, may require" (*Meridan Sanatorium* v. *Scruggs*, 83 So. 532).

Under Wisconsin law a charitable hospital is to be regarded as exempt from liability to a patient for the negligence of its chief administrative officer in selecting employees who are either incompetent or negligent and also for the negligence of such employees in administering to the needs of the patient (*Morrison* v. *Henke*, 165 Wisconsin 166, 160 N. W. 173).

Though the private hospital has been held responsible for the negligence or tortious acts of its employees, nurses, house staff, the charitable hospital, since the case of *MacDonald* v. *Massachusetts General Hospital* (120 Mass. 432) of 1876 has been, practically throughout the country, freed of this responsibility unless negligence in the employment of its servants was shown; but in *Glavin* v. *Rhode Island Hospital* (12 R. I. 411), in which the patient brought suit for the alleged malpractice of an intern, the court rejected this doctrine. "Where there is a duty, there is prima facie, at least, liability for its neglect, that when a corporation . . . is created for certain purposes which cannot be exercised without the exercise of care and skill, it becomes the duty of the corporation . . . to exercise such care and skill, and the fact that it acts gratuitously . . . will not exempt it from liability for any neglect of duty . . ." It is understood that the legislature of Rhode Island saw fit to exempt the hospital from liability. But the intern whose alleged malpractice was the basis of the suit is still open to attack.

Ever since 1846, when the theory of absolute immunity of the charitable institution resting on its "trust funds" was enunciated, down to the present time many court decisions have been handed down. Other states have accepted decisions of the New York State courts in large part. Confusion has resulted largely because there has been no movement by those most interested to clarify matters by legislative enactment.

"Instability of economic conditions, especially within the last ten years, has greatly altered and visibly changed the mental reactions of the average individual within our community. Particularly in the larger population centers the older, confidential and trusted relationship between the physician and his patient has given way to habits of medical shopping. There has been an increasing tendency to seek legal redress through malpractice claims. This has affected both the medical practitioner and the hospitals. The rise of more universal use of insurance for health, for accident liability and compensation, has also disturbed the management of hospitals to no small degree. It has stimulated greed in certain groups of individuals and has resulted in attempts to abuse both medical and hospital facilities through sharp practice. The hospital's stand must at all times be one of equity and this is often rendered difficult." [6]

Relief of illness, teaching and research comprise the functions of the hospital. Devotion to these has kept trustees, administrators and staff from adopting the methods of big business. They have not been active in legislation. When disputes arise, specific charges of negligence end in another court decision. The definition of the basic rights, duties and obligations of the patient, the hospital house staff and visiting staff are not defined by statute law. And it would appear that the majority of hospitals are exempted from liability for the acts of its interns, and the visiting staff members may not be responsible. The great danger is that the intern may be the most exposed of all those attached to the hospital.

6. Hayt and Hayt: Legal Aspects of Hospital Practice, p. x.

INTERNS AND LICENSURE

The physician is, quite properly, completely absorbed in healing the sick and, if he is fortunate, doing his bit in improving the practice of medicine. He is interested in practical methods for helping the underprivileged. He is loyal to his patients and they apparently are to him. He is rarely interested in legislation or politics. When he receives a communication from a lawyer making a claim against him the doctor stands aghast. He cannot believe that any patient can be responsible for this, to him, outrageous attack. The practice of the courts is a dread and a mystery; they hold no allure for him. On the other hand, accustomed to direct action, he feels that their methods are cumbersome, wasteful and inefficient.

No uniform policy for limited licensure or exemption of interns from provisions of the law exists in the various state enactments. Thirty-six states practically ignore the medical student and the intern. Sixteen states have statutory provision, most of them being exceptions to the application of the medical practice act. In a few states the intern and/or the medical student is affirmatively permitted to practice medicine in a hospital under the guidance of teachers. Apparently, Massachusetts alone grants "limited registration" for the definite period of his internship (section 9A ch. 112) on completion of three and one-half years of medical study in approved schools. The state also grants a limited license to (section 9A ch. 112) "assistants in medicine who are under supervision of an instructor," students who have completed at least two years in medical school. Limitations are placed on the activities of such students, and the hospital and the other institutions to which they are attached under the direction of staff members. For the period of his limited registration the intern is permitted to sign birth and death certificates.

New Hampshire permits "resident physicians" to practice in any legally incorporated hospital. This is not wholly satisfactory, since no report of appointment is required of the "resident" or the hospital. Supervision cannot be exercised by the board of registration. Physicians ineligible for registration may become, for an indefinite period, whole time members of the staff of such institutions as the state tuberculosis

sanatorium or the hospital for mental diseases without compliance with the medical act. A lenient attitude is shown interns apparently by boards of registration out of consideration for the financial position of these young men, many of whom do not intend to locate in the state. All of them are known to be under the supervision of mature staff members, who with the hospital are presumed to be responsible for the conduct of house officers.

But should the intern as an unlicensed physician be charged with malpractice he is indeed vulnerable and his defense is handicapped. The attorney for the plaintiff emphasizes the illegality of his action. In addition to the charge of professional misconduct he is charged with crime. In some instances in which the hospital has been freed from the charge of negligence the intern himself has been charged with the same offense. In those states where the internship service is demanded for licensure the decision of a Wisconsin court is pertinent:

> It cannot be said that the performance of the duties with which it was alleged the defendants were charged were duties that it would have been lawful for them to perform. The law recognizes that a hospital internship of at least twelve months is required before a license to practice medicine may be granted. Although under the law no person may practice medicine, or hold himself out as authorized to practice medicine, without first securing the required license or certificate, yet the law itself requires an internship as a part of one's medical education before one can be licensed to practice. This is a legal sanction of the performance of such duties on the part of interns as are usually and ordinarily performed by them. The performance of such duties does not constitute the practice of medicine or a representation that the intern is authorized to practice medicine.[7]

A widely quoted decision of the New York Court of Appeals (*Hendrickson* v. *Hodkin et al.*, 276 N. Y. 252, 11 N. E. [2 D] 899) sets a precedent for possible court decisions making a hospital liable for the practice of any person not licensed by the state authorities.

MALPRACTICE

Malpractice is a distasteful subject. But it is an important subject, and if the experience of the recent past is to be that of the future it will demand more consideration. Hospitals with their trustees, staff, nurses and employees as well as private practitioners are all involved. No hospital is immune to the charge and there is no person concerned with medical care of patients in the hospital who is not liable to attack. House officers have been made defendants in actions for malpractice to the point that serious consideration should be given to means for their protection. A recent case, involving assault because of lack of a state certificate, and malpractice as well, required the united efforts of counsel for the hospital and attorneys for the state medical society to free the accused.

Nearly all suits for alleged malpractice end in a verdict for the defendant, but the effects of inevitable publicity faced by the house officer, the sense of unjust persecution can but injure the morale of any young man, whose career may be terminated then and there. Practically never is lack of knowledge the basis of complaint. Those interested in this subject feel that malpractice claims are increasing. Certainly suits against hospitals are common enough. Modern social philosophy demands security for the individual without his own responsibility for himself. The facility with which insurance can be purchased for almost every contingency, the widespread knowledge that almost everybody is insured, leads to unusual demands for satisfaction by the injured. It is no longer possible for the injured to be the cause of his own accident, and the law of contributory negligence has nearly ceased to operate.

It is a fact that some hospitals are understaffed, and interns, some routine administrative work being essential, may be hurried or become careless or, because of fatigue, make the fatal slip in technic or the thoughtless remark that leads to trouble. Sufficient oversight by the staff and relief from some routine will prevent such errors. To the ward patient the intern is the patient's doctor, coming closer, by far, to the man or woman than the chief visiting surgeon. We cannot forget that.

It may be argued that the chances for malpractice suits involving the intern are rare. But the slight yet perceptible increase in this sort of litigation, and the eagerness of attorneys for business, do not increase the safety of the intern. Such cases, like many others taken on a contingent fee basis, possess a nuisance value at least. Some settlement, however small, must be made, or one must face the alternative of expensive litigation. Attention should be directed to the evolution of some scheme for protection of the intern from attack.

CONCLUSION

From this study one may conclude that the exact status of the intern has not been established. To his medical school he may be a student or an alumnus, to the hospital an officer or an employee or an independent contractor (private opinion of attorney), to the state a student or a physician either licensed or unlicensed. With the change in our concept of the internship as an essential part of the education of the physician with gradual standardization of the state requirements for the practice of medicine, with the increasing emphasis on longer hospital training, the status of the entire house staff should be definitely established.

7. Medicolegal Cases: Abstracts of Court Decisions of Medicolegal Interest 1931-1935, Chicago, American Medical Association, 1936, p. 257.

The house officer should have the protection of the law and certainly the moral protection of the hospital and organized medicine. State boards of registration should either demand registration before internship or grant exemption from the requirements of the medical practice act. Suits for malpractice having a serious effect on the future of these young men should be prevented. It is a matter of concern for us all.

The contribution of the members of the Federation of State Medical Boards might well be, where it is lacking, a legalizing of the position of the intern, for the protection of the man himself and the hospital he serves. The grant of a temporary certificate as provided in the Massachusetts law would remove much of his handicap.

Brown House.

Comments and Reviews

CONCERNING INTERNS AND INTERNSHIPS

Abridgment of an article by Reginald Fitz, Wade Professor of Medicine, Boston University School of Medicine, and published in the Journal of the Association of American Medical Colleges, March 1939.

There regularly develops in medical schools at the end of the third year, or early in the fourth year, an epidemic of worry over internships. This seems a pity, because the clinical work should not be interrupted by extraneous factors.

From two successive surveys of the Massachusetts interns and internships, it is apparent that our internships are regarded as useful and that our interns, in general, are promising young men. The better students select our better teaching hospitals in which to be trained; on the whole, the better the internship offered, the better is the scholastic record of the intern who is accepted; the weaker hospitals which offer the poorest training attract the poorest students.

Not all of the best scholars in the Boston schools care to remain in Massachusetts for their internships; in fact, some of our best students prefer to go to other parts of the country for intern training. To make up for their loss, we attract graduates from other schools. On the whole, this also is satisfactory. The men from outside schools, as a general rule, are acceptable and stimulating scholars, so that to have them wish to come to Massachusetts is a feather in our cap.

A situation has arisen, however, which is not so pleasant. Hospitals naturally wish to attract to themselves the best possible interns they can get, and to do this they appear to vie with one another in making their appointments at earlier dates than do their competitors.

For many years the Boston teaching hospitals have held examinations for interns on or about January first. A number of hospitals outside Boston were written to for information concerning the date at which their 1939 appointments will be made to include candidates who will not graduate until June. Twenty-three hospitals have replied to this letter. Each of these hospitals can safely be guaranteed to any student as offering as good an internship as is obtainable in the United States. In most instances they represent teaching hospitals in various parts of the country which are in the habit of drawing away from Massachusetts fourth year student material of the highest caliber. These hospitals make their appointments as early as November (two hospitals), early in December (five hospitals), and mostly during the Christmas holidays, a time which appears to be convenient for personal interviews between hospital and applicant to take place.

Thirty-nine hospitals in New England approved for intern training, but not strictly allied with medical schools, also replied to the letter. In this group the answers were particularly interesting. One hospital is so forehanded as to make intern appointments in July for men who will not graduate until the following June. Another makes its appointments in September, one in October, one in November, many in December, and only a comparative handful after the first of the year. One excellent hospital wrote, very honestly, "In years past we have always made our appointments on or about February 15, but from our experience of the past year we found that many of the applicants for our internships canceled their applications and some even canceled their appointments which they have received because they had accepted appointments in hospitals elsewhere. It is our feeling that we should make our appointments this year not later than January 1. We wish that there might be some way that the intern committees serving the various hospitals could come to a definite understanding as to the date of appointment for interns."

COMPETITION FOR INTERNS

Medical schools in other parts of the country wish that such ardent competition for interns as now exists could be done away with and that intern committees serving the various hospitals could come to a definite understanding as to a uniform date of appointment for interns.

Nor is the problem a new one. Thirty years ago a representative hospital, such as the Massachusetts General Hospital, held its examination for interns in the early spring. Little by little, however, as the importance of internships was universally acknowledged and as the competition for interns grew keener, the date of examination for the Massachusetts General Hospital was pushed back closer to the beginning of the fourth year in order to keep in step with what other hospitals were doing. This method of approach to the situation was not effectual. All that happened was that other hospitals pushed their examinations even further ahead.

Finally, medical students themselves began to complain of what was happening. In 1937 Victor Richards, a junior in the Stanford University School of Medicine, published an interesting paper entitled "The Internship," giving an undergraduate's point of view on the matter.

Nearly a year ago the third year classes of the Harvard Medical School and of Tufts Medical College wrote letters to the Boston Committee suggesting, in effect, that it would be highly desirable from these students' point of view if some arrangement could be established by which intern appointments could be made in various hospitals at about the same time, thus to "avoid the complications and duplications heretofore experienced."

Thus, it is apparent that medical schools, hospitals and students all dislike the present confusion and feeling of competition regarding intern appointments. Some sort of a reform is badly needed.

DESIRABILITY OF A REASONABLE TIME SCHEDULE

As to what can be done and how to do it is more difficult to say. Boston has made efforts, sporadically, to have its examinations for interns in the teaching hospitals come at the same time as do the examinations for interns in other teaching centers. This effort has never met with any wholehearted support, chiefly because each hospital is apt to desire a personal interview with prospective interns and it is practically impossible to work out a reasonable time schedule that will suit every one. The Intern Placement Bureau of the Association of American Medical Colleges is playing a helpful part in the matter, and as the bureau develops its scope it may become even more useful. Fundamentally, however, in Boston we feel that, since hospitals, students and medical schools recognize the evils of the present way of doing things, the reason that these evils have not been corrected must depend on lack of positive leadership and a lack of any well defined, broad policy.

If the schools would agree to give out no information regarding any student's abilities to any hospital before a certain date to be agreed on, part of the more ruthless competitive methods now in use for attracting interns might be done away with. And if the hospitals would live up to an agreement not to examine intern candidates or to make intern appointments before a date to be set by the American Hospital Association, the matter would be still further clarified. Finally, it might be possible for the teaching hospitals to combine examinations in some manner and to interchange candidates, thus doing away with unnecessary examinations and traveling on the part of students.

THE HIGH ROAD

Abridgment of an address by Dr. Howard T. Karsner, professor of pathology, delivered at the commencement exercises, Western Reserve University School of Medicine, June 15, 1938, and published in the Clinical Bulletin of the University Hospitals of Cleveland, September 1938.

Ordinarily a long life may be expected to have furnished equanimity and wisdom. Add to this a life in a laboratory, secluded from the bewilderments and hurly-burly of competitive efforts in the world of affairs, with time for meditation and leisure, the setting is right for an outlook of wide perspective. If that laboratory man happens to be a pathologist, his hands stretch out on one side to the so-called nonclinical divisions and on the other to the glamorous clinics. He may be not much of a scientist and nothing of a clinician, but he has an acquaintance with both and he usually thinks his field gives him privileges in the way of liberal interpretations.

What can he say to those who are ready to enter the fields of practice? Can he give advice about the details of practice and, if he could, would his recommendations have concrete value? What can he say about the specialties and the specialists? Can he dilate on the confused state of world affairs? Tempting as these questions are, this occasion gives me the opportunity to speak of broader principles in the hope that they will offer guidance to the high road to a happy life spent in service of one's fellow men.

This is said in no spirit of abstruse altruism. It refers rather to the adventures of that scientific pursuit which, by the selection of a career, students have laid out for themselves. Full of interest in its daily work with patients, exciting in its new discoveries, enlightening in its contacts with the phenomena of nature, revealing in its study of mind and matter, consoling in its successful results and tragic in its failures, this calling of ours has spiritual rewards not to be equaled in any other profession.

The distinguished members of our profession all have put something more into their work than their less noteworthy colleagues. To be sure they have an aptitude, a gift, a flair for the

task, they have had good fortune from time to time, but they have applied themselves incessantly to attain success and, above all, they have believed in and loved the job they chose. Claude Bernard once said "We stand upon the intellectual shoulders of those medical giants of bygone days and, because of the help they afford us, we are able to see a little more clearly than they were able to do."

There are features of our profession which deserve particular thought. First, some comment about the case as a patient. You have devoted the major part of four years to becoming competent to determine the disease from which the patient is suffering and the means of managing it intelligently. This training will always be a considerable part of your psyche and this foundation must ever be refreshed, extended and deepened. Go to meetings, read the journals, discuss with your associates, attend graduate courses but, after all, the continuation of your own initiative and progress depends on an inquiring and critical intelligence which never falters. Thus you can improve your knowledge of organic disease, without which you lose dignity as a physician and become little more than a pedler of pills. If your attention is confined to diagnosis and treatment you may know much about disease but little about the patient. This has often been spoken of as a difference between the science and the art of medicine. It is no art to be well aware of the social and psychologic implications of illness, nor is it an art to be so devoted to the welfare of your patient that with sympathy and consideration you will aid him in his necessary adjustments. It is not an art to be human and humane. These are inherent qualities of that spirit which has called you into the field of medicine. No courses in medical schools are necessary for kindly, generous and thoughtful consideration of those frailties of human nature which often alter personality when illness strikes. There are, however, dangers in sympathy. The physician must guard against allowing his feelings to overcome his judgment. Thus, in order to carry on successfully, a balance must be attained between sympathy and calm appraisal of the situation. If the doctor can assure himself that his diagnosis is correct and his treatment appropriate, he can await the outcome with poise and equanimity which are essential to him and to the welfare of his patient.

SO-CALLED IMAGINARY ILLNESSES

In your courses of instruction you have dealt largely with disease as expressed by organic disturbances. You have given consideration also to the personal aspects of disease but you probably have paid little attention to what are often thoughtlessly called imaginary illnesses. If this is true I desire to remind you that in the practice of medicine you will be repeatedly confronted by patients with this sort of disturbance. You may easily become impatient with patients' complaints for which, even after the most careful examination, you can find no organic basis. You may be tempted often to dismiss the matter and the patient with the comment that there is nothing wrong or you may resort to some more or less shady method to shock him out of his beliefs. This may be effective, but only temporarily. Psychoneurosis is a real disease, even though you may not find an organic basis. The headache from which the psychoneurotic suffers is headache, his pain is genuine, his vomiting is not imaginary. His incapacity is an economic problem and his suffering cannot be alleviated by telling him there is nothing wrong. The child who was blind because a firecracker exploded near him was unable to see even if his eyes were normal. The boy who could not swallow was really emaciated even though his esophagus was perfect. The woman bedridden for years was an invalid in spite of the fact that her spine was unaffected. This disease does not spare man, woman or child, rich or poor; even if its basis is emotional, that in itself is fact. It is your duty to find the reason for this disturbance and to teach or reeducate your patient to adapt himself to his environment, to adjust himself to his limitations, to make himself at peace with the world. The meaning of the word doctor is teacher and it can have no better exemplification than in the management of the psychoneurotic. If the general practitioner cannot care for the patient he must not turn him away but refer him to one who by temperament and training can. This course is more than the treatment of the current attack. When properly carried out it gives the patient a new outlook, it trains him to be dependent on himself and thus prevents recurrence or new manifestations. This whole problem presses on all branches of medicine. You cannot avoid its consideration by saying that you will ultimately specialize, for all those who practice in whatever specialty must deal with the problem.

RATIONAL PSYCHOTHERAPY

This aspect of practice is more important than your individual success. Its neglect by physicians has had as much to do with exploitation by the cultists as any other factor in society. The responsibility for the upbuilding of the cults rests largely on the shoulders of your predecessors who have neglected the psychoneurotic, and the cults will continue to grow if you fail in your duty to your patients and your profession. If we in medicine were to recognize the merits of rational psychotherapy and utilize it, we would not be subject to the humiliation of having our friends and patients cured by a

twist of the foot or a travestied verse from the Bible, nor need we resort to these tricks. We cannot comfort ourselves that this quackery appeals only to the unintelligent, for we know well educated, fine people who voluntarily subject themselves to it. The reason behind this is often that the doctor has failed in his job. He has neglected psychoneuroses and has left the patient to his own resources. The patient, unfamiliar with the nature of or reason for his illness, then turns to some one who will help him. It is no reflection on his education or intelligence that he does not know what ails him. His doctor has failed him and he still needs help. The personality and salesmanship of the quack are ready substitutes for appropriate medical care. What we need is to fulfil our function as teachers. We have our faults, we shall make errors, we shall find that new discoveries make our older methods obsolete, we shall learn that truth is only relative. In spite of failures we can point with pride to our progress. With continued study, widening experience, careful observation and sound logic our successes become proportionately greater. Let us be true to our calling and earn the tranquillity that loyalty engenders. Go forth on the road and follow it to the heights. I wish you all success and happiness.

PHYSICAL FITNESS AT UNIVERSITIES

Abridgment of a discussion published in Nature, May 14, 1938. It refers especially to universities in England.

Those Englishmen who are acquainted with the universities of Canada and the United States have long had cause for astonishment at the way in which the universities of Great Britain have lagged behind those of America in their care for the health and fitness of their students. In those countries at any rate it cannot be suggested that the desire to produce a healthy population is a sign of latent militarism or of any peculiar brand of politics. To an American or Canadian student—or professor—visiting Great Britain it seems incredible that in most universities there is no medical examination whatever, either at entry or later on, no organized system (voluntary or compulsory) of physical exercise, little provision (except in a few privileged places) for healthy recreation "in the spare half-hour," no arrangement to provide medical or surgical advice or treatment when required.

The causes of this neglect are various and to some degree, at least, a matter for speculation: the medieval view, based on a false antithesis of mind and body, that the universities exist solely for the training of the intellect; a superstitious horror of anything which might savor of organization, discipline or compulsion in personal affairs; a belief in the magic of laissez-faire; the dominant position in public life of Oxford and Cambridge, where the colleges exert a parental influence, where most of the students are not so poor, and where games and recreations are much easier to get; indifference; a fear that students themselves might not cooperate. The last cause at least is removed by the publication of a pamphlet[1] on behalf of the students themselves. It is peculiarly timely because, unknown to its writers, a new movement was already under way and that movement will be given greater confidence and strength by the knowledge that the National Union of Students is openly and emphatically sympathetic. The committee of the union which discussed the matter "was struck with the fantastic lack of attention there had been in this country to scientific methods of physical education. . . . It became more and more impressed with the importance of preventive as well as curative methods." The systems in other countries, it found, "indicate a very general acceptance by the universities of a great measure of responsibility for the physical as well as the intellectual well-being of their students, a responsibility which is still to a large extent shirked by the universities of Great Britain."

FACILITIES FOR RECREATION

In the autumn of 1937 the National Fitness Councils for England and Wales and for Scotland invited the University Grants Committee to advise on the distribution of a capital sum of £230,000 to aid the universities of Great Britain in providing urgently needed facilities for healthy recreation and for physical exercise. The sum itself is small—only about one tenth of the annual Treasury grant, for all purposes, to the universities—and it can do no more (it was not intended to do more) than catalyze the interest of the universities themselves and perhaps of their potential benefactors. That, however, it is beginning to do, and although the £230,000 itself cannot be spent otherwise than on facilities for healthy recreation—on gymnasiums, swimming baths, squash courts and the like—it has set the universities thinking and planning, and ultimately very much more may result. In most of them, indeed if not all, voluntary medical examinations are to be instituted, lectures will doubtless be given on matters relating to health, the status of members of the staff dealing with physical training is to be raised, the cooperation of scientific and medical departments is to be sought, committees are to be formed to consider the place of student health as a proper function of a university and probably, under the guidance of the Medical

1. Student Health: Report of an Enquiry into University Health Services by the National Union of Students, London, National Union of Students, 1938.

Research Council in certain special centers, a scientific examination of the problem is to be instituted. An attempt is to be made in fact to give to the subject of bodily and mental health and fitness its proper university status. Those, however, who take a longer view will realize that it is not merely "student health" as such which is to be aimed at but, through the universities, the intelligent and conscious application of a new biologic outlook on human beings, an outlook intended ultimately to affect the entire community.

To recognize disease, minor ailments, chronic undernutrition, mental trouble or anything lowering the level of happiness, fitness and usefulness in university students, and to provide means of improvement, are important enough. Even more important, however, in the long run is to send out steadily into the community a stream of intelligent and keen young people who have learned, even in a minor way, what a health service can do for them and their friends, and how necessary it is to the happiness and well-being of the people.

ACHIEVEMENTS OF STUDENT COUNCIL

The Student Council at Wayne University College of Medicine, Detroit, has matured as a competent student self-government body, said the dean, Dr. Raymond B. Allen, in his recent annual report. Among its noteworthy achievements have been the establishment and successful administration of an honor system for the conduct of examinations in the college, the publication of the student-alumni journal, which is entering its second successful year, the publication of a student handbook, the creation of an interfraternity council, the establishment of a local chapter of the National Association of Medical Students and the institution of student-faculty-alumni banquets, which have served as an active socializing influence for all three groups and have helped to develop an *esprit de corps* and pride in the school without which the work of the faculty would be without real value.

Another significant contribution of the Student Council has been its analysis of student questionnaires which solicited constructive criticism on the medical curriculum. This study clearly indicates that the students recognize the importance and value of sound fundamental training in the medical sciences. Suggestions have been forthcoming which have helped to improve the effectiveness of the teaching program. The faculty recognizes that students are not competent to pass on the content of the medical curriculum, but it appreciates that students are in a position to know whether or not the faculty efforts are effective in attaining educational objectives.

One aspect of the Student Council's study relates to the economic status of the students. Inquiry was made into the outside activities of students which of necessity detract from their ability to apply themselves to medical studies. The council was not surprised to find that a large proportion of the students support themselves entirely or in part through gainful employment. Some students hold eight hour night positions in industry. The majority of these, however, are engaged in some form of medical service, usually in the nature of first aid posts in industrial plants. Fortunately, such duties are not arduous and serve in some ways to promote rather than hinder their medical education. However, it is perfectly clear, Dean Allen said, that a large fraction of students do not receive sufficient financial support to be in a position to gain the greatest possible benefit from their studies. This study, therefore, indicates that means must be found for furthering the security of deserving, needy students. The board of education and the alumni association of the college of medicine have, through loan funds, rendered great help in the neediest of cases. Many students, however, are reluctant to go into debt for their medical education and do so only in the greatest extremity, usually to meet tuition fees. The solution is obvious: scholarships should be available for students who have proved their right to such subsidy. Some aid is rendered through the National Youth Administration and through student assistantships. These devices, however, are not to be encouraged for the reason that the student is required to give time which he would otherwise be devoting to his studies.

Interest in Civic Affairs

It is just as important that physicians be made social conscious as it is that the public be made health conscious. This can be brought about effectively by emphasis on the community aspects of medicine both in the medical school and after graduation. Such a study and social interest on the part of the medical profession will insure its rightful heritage of preserving the health of the public and supervision of all forces engaged, for four reasons: First, it will stimulate the young physician to take an active interest in civic affairs, and to seek and accept public positions for which his training makes him especially adapted. He will thus become more familiar with the social and medical status of his community, and sympathetic with and interpret the needs of the man of the street. Secondly, it will give the physician a better understanding of the factors which may have lowered the patient's resistance and apply appropriate measures to remove them. It is generally recognized that a patient's mental attitude often has a great influence on the course of a disease. Social and economic conditions directly affect the mental status of the patient and are often, therefore, of prime importance in dealing with his disease.—Wahl, H. R.: Community Aspects of Medicine, *J. A. Am. M. Coll.* **13**:14 (Jan.) 1938.

Medical College News

Medical schools, hospitals and individuals will confer a favor by sending to these headquarters original contributions, reviews and news items to be considered for publication in the Student Section.

Student Book Exchange at Michigan

The Board of Regents of the University of Michigan, Ann Arbor, at a meeting in December, gave permission for the establishment of a Student Book Exchange at the university on condition that only used books would be handled. A committee was formed comprising the dean of students, the dean of women, and representatives of the Michigan Union and the Michigan League to direct the venture. The exchange operated for the first time February 3-17 and sold books to about 2,000 students. About 1,700 students left books to be sold, setting the price that they wished to receive, with the understanding that the exchange would retain 10 per cent of the sale price to cover expenses. The next sale of used books will be in September, for which books will be received in the exchange as early as June.

New Division of Bronchoscopy

A division of bronchoscopy and esophagoscopy is being organized at Louisiana State University Medical Center, New Orleans, in anticipation of the opening of the new Charity Hospital, which will contain a fully equipped unit provided with biplane fluoroscope and similar equipment. Dr. George J. Taquino will be in charge of the division in the medical school, the staff to consist of members of the department of surgery and the division of otorhinolaryngology. Dr. Chevalier Jackson, Philadelphia, has been visiting professor of bronchoscopy and esophagoscopy at the medical center since it was opened in 1931.

Banquet for Premedical Students

The fifth annual banquet for premedical students throughout Texas was held recently under the sponsorship of the Texas Alpha chapter of Alpha Epsilon Delta. Dr. John W. Spies, dean, University of Texas School of Medicine, Galveston, was toastmaster; the speakers were Drs. Holman Taylor, Fort Worth, secretary of the Texas State Medical Association, and Dr. William R. Houston, Austin. Seven colleges were represented by 364 premedical students.

Dr. Lapham Appointed Dean at Tulane

The president of Tulane University has announced the appointment of Dr. Maxwell E. Lapham as dean-elect of the school of medicine of the university to succeed Dr. Charles C. Bass in 1940. In that year Dr. Bass will reach the retiring age.

Dr. Lapham, now 39, was born in New York and graduated from the University of Pennsylvania School of Medicine in 1925, following which he served two years as an intern at the Presbyterian Hospital, Philadelphia, and then was house surgeon at the International Grenfell Hospital in Labrador. He was a resident in the University Hospital, Philadelphia, for two years and then engaged in the private practice of medicine for three years. In 1933 Dr. Lapham took up graduate medical extension teaching, giving courses of instruction to practicing physicians throughout the state of Virginia under the auspices of the University of Virginia and in cooperation with the Virginia State Medical Society and the Medical College of Virginia. Later for two years he gave extension courses in obstetrics to practitioners in Mississippi in cooperation with the Mississippi State Health Department, the Mississippi State Medical Society and Tulane University.

In 1937 Dr. Lapham was appointed director of the extension division of the department of graduate medical studies at Tulane. He will continue in this capacity for several months, as well as in his work as assistant professor of obstetrics and in the fall he will undertake a tour of the medical schools in this country and in some foreign countries.

Examinations for Internships in Naval Hospitals

An examination is held in November each year for senior medical students of class A medical schools who desire to obtain an internship in one of the United States naval hospitals. Senior medical students who qualify for appointment to an internship will be appointed acting assistant surgeons with rank of Lieutenant (junior grade) for temporary service during the intern year. On satisfactory completion of the internship, the intern will be allowed to appear for competitive examination for appointment as assistant surgeon with the rank of Lieutenant (junior grade) in the medical corps of the navy. Should the intern desire to return to the practice of medicine in civil life, his appointment as an acting assistant surgeon will be terminated and he will be honorably discharged from the naval service. To be commissioned in the medical corps of the navy the candidate must be a citizen of the United States between 21 and 32 years of age and he must pass both professional and physical examinations. On accepting an appointment as acting assistant surgeon for internship, the officer will receive a compensation of $2,699 a year if he has no dependents, and $3,158 a year if he has dependents. Successful candidates for appointment as interns will be appointed in July and will be assigned for internship to a naval hospital either in Boston, New York, Philadelphia, Washington, D. C., Norfolk, Va., San Diego, Calif., or Mare Island, Calif. The period of internship is one year, is rotating and consists of about five months medical, five months surgical and two months laboratory duties. For additional information address the Bureau of Medicine and Surgery, Navy Department, Washington, D. C.

Harvard Extends Its Public Service

Extension of the public service of the Harvard Medical School in Boston through the newly formed department of legal medicine was announced January 5 by the dean in his annual report. Dr. Alan R. Moritz, after another year in Europe, will return to build up the department of legal medicine and to put at the disposal of the state the contributions that such a department can make to problems of law enforcement and of public health which come within its scope. Dr. Moritz came to Harvard from the University Hospitals, Cleveland, in 1937, to be the first holder of the professorship of legal medicine established under the terms of a gift designated as the George Burgess Magrath Endowment for Legal Medicine. He succeeds the late Dr. George Burgess Magrath, who taught legal medicine at Harvard from 1907 to 1937.

Dean C. Sidney Burwell said that the medical school has a direct and useful contribution to make to the community and that in turn it is dependent on many

community organizations for essential parts of its teaching opportunities.

The Harvard Medical School is associated with fourteen local hospitals through clinical teaching or investigation. A close coordination exists between the state department of public health, the department of public health of the city of Boston, similar departments in other cities, and appropriate departments of the medical school and school of public health. Thus the medical school is happily able to make some return to the community which supports it not only in training practitioners of medicine and investigators, Dean Burwell said, but in contributing to the care of the community's sick and to other aspects of community life where expert medical knowledge is useful.

The Wassermann Laboratory of the Massachusetts Public Health Department, established in 1909 by the Medical School, is still housed in Harvard buildings. The laboratory affords facilities for testing the blood and spinal fluid of patients in the state hospitals for mental disease. In 1917 the Massachusetts State Tumor Diagnosis Service was established as a joint activity of the Massachusetts Department of Health and the Collis P. Huntington Memorial Hospital of Harvard. This service supplies pathologic diagnostic service for physicians in the state and for hospitals without service of their own. Harvard Medical School also organized and established the Vaccine and Serum Laboratory at Forest Hills. For several years the Faculty of Medicine has arranged a series of public Sunday afternoon lectures on medical subjects at which last year the total attendance was more than 3,000.

Medical College of Virginia

The historic Egyptian Building at the Medical College of Virginia is being made fireproof; the remodeling will also provide an auditorium seating 400, done in the Egyptian manner. In the future the Egyptian Building will house the departments of pathology and bacteriology.——An eighteen story hospital to replace the Memorial and Dooley hospitals is under construction and should be ready for occupancy in the spring of 1940.——An additional floor which is being added to McGuire Hall will furnish medical facilities for the departments of physiology and pharmacology.——The new dormitory completed last July has been named Hunton Hall in honor of the late Eppa Hunton Jr., a member of the Board of Visitors for many years. These and other construction projects at the Medical College of Virginia will involve an expenditure of more than $2,000,000.

Yale Alumni Day

Special lectures, clinics, ward rounds, laboratory demonstrations and conferences were presented at Yale University School of Medicine, New Haven, Conn., February 22, in celebration of Alumni University Day. Guests were also invited to visit the laboratories and see the facilities of all departments of the school, including the Clinic of Child Development and Laboratories of Primate Biology. There were demonstrations of the ultracentrifuge, of the laminograph, of the bioelectrical potentials in living systems, of the apparatus for studying electrophysiology of the brain, of the heart sounds by loud speaker and of monkeys and chimpanzees with spinal and cerebral lesions. The day closed with an assembly in the auditorium of Sterling Hall of Medicine, which was addressed by Drs. Francis G. Blake on "Sulfapyridine in Pneumococcal Infections," Milton C. Winternitz on "The Pathology of Arteriosclerosis," Hugh M. Wilson on "Body Section Roentgenography," and by the dean, Stanhope Bayne-Jones, on "Plans for the Future of the School."

Ohio State Board Questions

Following are the questions used by the State Medical Board of Ohio in practice, Dec. 7, 8 and 9, 1938, at Columbus:

1. A patient returning from a late summer motor trip, complains of headache, diarrhea and slight fever of ten days' duration —what would you suspect and what other signs would you look for? How establish a diagnosis?
2. Give three possible terminations of arterial hypertension and upon what sign would you base the most probable in a given case?
3. Discuss undulant fever: the etiology, usual source in this country, symptoms and treatment.
4. Give the symptoms of suspected coronary occlusion and how to establish the diagnosis?
5. Give the symptoms of Addison's disease with treatment.
6. Give the usual etiology of enuresis and treatment.
7. How would you recognize pyloric stenosis in a recently born infant?
8. How would you manage a case of acute diarrhea in a 2 year old child?
9. Enumerate the most common symptoms of schizophrenia. Give the clinical course of a typical case.
10. Name the most frequent organic psychoses and state the most common mental symptoms characteristic of the entire group.

Convention of the Association of Medical Students

The third annual convention of the Association of Medical Students held in Philadelphia beginning Dec. 22, 1938, was attended by 303 delegates, of whom 279 were medical students and twenty-four were visitors, including one representative of the American Youth Congress; the women medical student delegates numbered thirty-eight. The delegates came from twenty-four states and the District of Columbia; India, Korea and Canada were also represented, while six premedical colleges sent representatives to learn about the Association of Medical Students. Twenty-three resolutions were passed at the business session. The program of this convention was published in the December Student Section in THE JOURNAL. Student Trawick H. Stubbs of Emory University Medical School, Atlanta, Ga., and Student David E. Hepford, Temple University Medical School, Philadelphia, were elected co-presidents of the association for this year.

Senior Students Tour Pharmaceutical Laboratories

The present seniors of Indiana University School of Medicine made a tour of inspection of the Eli Lilly & Co. pharmaceutical laboratories at Indianapolis recently and were guests at a luncheon at the laboratories and a dinner at the Hotel Severin. Dr. Clayton G. Weigand was the principal speaker; Dr. Willis D. Gatch, dean of the medical school, represented the students on the program. An annual tour of inspection of these laboratories has been made by each senior class for nearly twenty-five years.

Dinner to New Dean

Dr. William S. McEllroy, who was recently appointed dean of the University of Pittsburgh School of Medicine, was honored with a dinner at the Hotel Schenley March 1 by alumni of the school and friends. Dr. Charles H. Henninger, Pittsburgh, president-elect of the Medical Society of the State of Pennsylvania, was master of ceremonies, and addresses were made by Chancellor John G. Bowman, Dr. Alexander H. Colwell and Dr. McEllroy.

Annual Lecture at University of Colorado

The first annual Nu Sigma Nu lecture before the faculty and students of the University of Colorado School of Medicine, Denver, was delivered April 7 by Dr. Walter L. Palmer, associate professor of medicine at the School of Medicine of the Division of Biological Sciences, University of Chicago, whose subject was "Recent Advances in the Study of Gastric Disease."